THE IRON AGE

THURSDAY, AUGUST 29, 1889

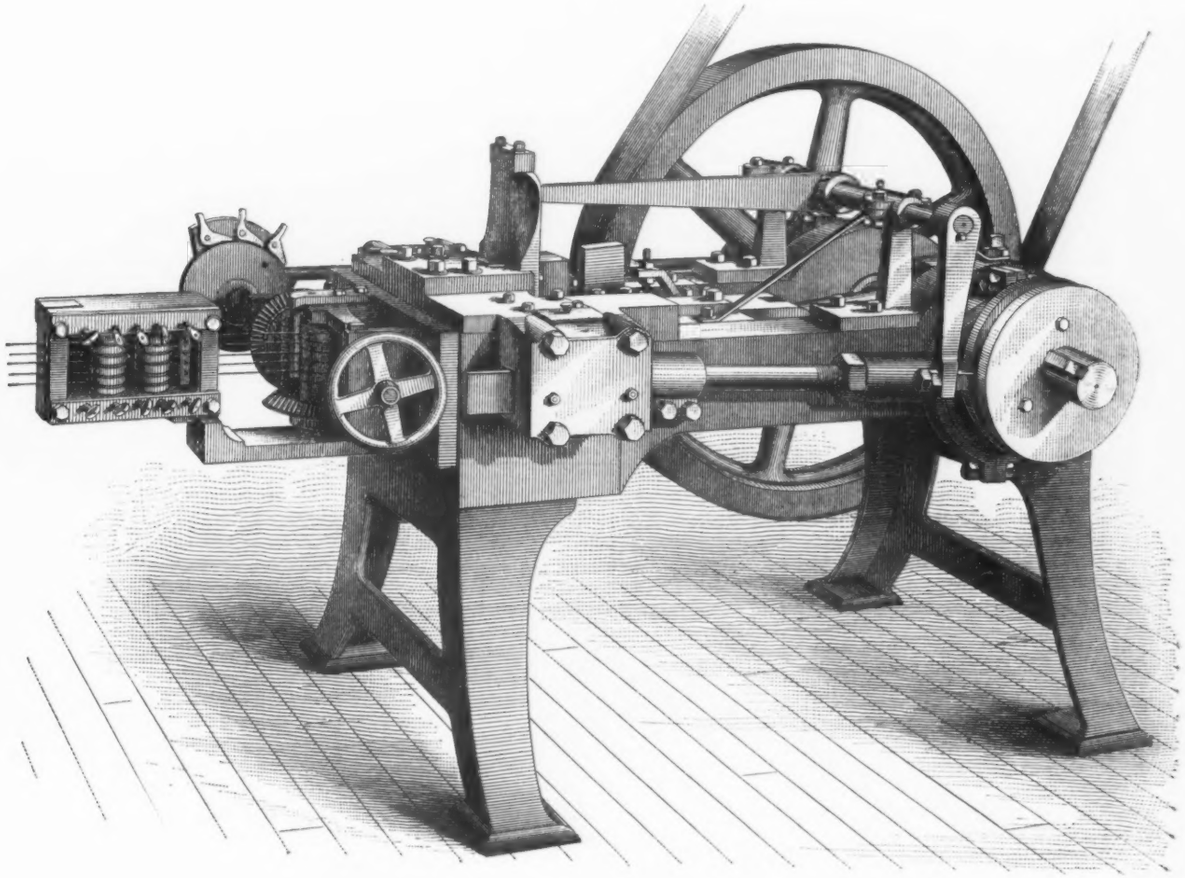
The Haskell Dynamite Gun.

The Board of Ordnance and Fortification have provided the funds necessary for the purchase of an 8-inch Haskell multi-charge dynamite gun of the model known as that of February, 1889, the intention being to use the gun for experimental purposes. It will be made at the Cold Springs Works and will be tried at the Sandy Hook grounds. The Haskell system, as our readers will remember, consists in starting the shot with a small charge of slow-burning powder, and then increasing gradually the propelling force by the ignition of charges of quick-burning powder arranged in a series of pockets placed along the tube of the gun, these pockets resembling in the guns heretofore made warts or excrescences growing out of the tube. By this means it has been claimed that a greater muzzle velocity could be obtained, and with less internal pressure than by the use of one large charge placed in the breech of the gun, as the theory is that the ball is started by the first small charge of powder, and as it passes the first or nearest pocket to the breech the charge of quick powder therein contained is exploded, adding to the pressure behind the ball; as the ball reaches the second pocket the charge there is exploded and so on to the muzzle, the ball being in its course through the gun subjected to a series of impulses, each of which adds to its velocity and at the same time subjects the gun itself to a much less pressure than is usual with one large charge. The present gun will serve as a basis upon which to determine the efficiency of the weapon, and whether or not its claims will hold good. The gun it is now intended to build will be used for throwing shells containing a charge of dynamite, for which purpose it is claimed to be especially well adapted, owing to the slow initial speed and absence of shock. The aim will be to use a very large charge of dynamite in the shell, the premature explosion of which will be guarded against by using a very small charge of powder in the breech to start the shell. The gun formerly tried at Sandy Hook contained as a first charge in the breech 18 pounds of powder, and in each of the four pockets placed beneath the gun a charge of 28 pounds of quick-burning powder, making in all 130 pounds, an excessive charge for a gun 6 inches bore and weighing 25 tons.

Locomotives altered in their fire-boxes for the burning of coke have been run on the Baltimore and Ohio Railroad with success, the special object being to abate cinders on the passenger trains. A limited express from Baltimore thus adapted arrived in Philadelphia ahead of time. A coke fire has to be pretty shallow, and when the firemen got over the habit caused by the use of bituminous coal of piling coke high in the fire-box, there was a hot fire with no smoke or cinders. The weight of coke used was about the same as would be required of bituminous coal.

Five-Wire Nail Machine.

The accompanying engravings show a new machine for making wire nails, which is the invention of and is manufactured by John T. Kennedy, New Haven, Conn. The machine is simple in construction and all the parts are simple and not liable to get out of order. The heading is done by means of a crank, the same as in the common riveting-machine, and all the parts are operated by positive motions. Fig. 1 of the detail drawings is a front elevation of the cutting-off 7, and gripping dies 12. The cutting-off dies are worked by means of the roll 10, and slide 4, the latter being operated by an eccentric on the shaft. Fig. 1 shows but one side of the machine, the other side of which is a duplicate. Fig. 2 is an end view of the cutting-die holder. Fig. 3 is a top view of the cutting die holder and the gripping-holder, and shows the method of working. The cutter 7 is adjusted by the wedge 6, and the holder 2 is forced by the incline on the slide 4 and drawn back by a small roll in a corresponding incline. The gripping-die 12 is held in the holder 5 by a screw, and this holder is keyed into the holder 3, which is forced forward by the knuckle-joints 3′ 3″, operated by a pitman and lever from a cam on the shaft, which has a power on the gripping-dies of 24 to 1. The holder 3 on the other side of the machine is keyed into the machine and is not formed with the knuckle-joints. Fig. 4 is a side and top view of the punch



FIVE-WIRE NAIL MACHINE, BUILT BY JOHN T. KENNEDY.

for heading the nails, which is moved by a crank and shaft.

The machines are made in two sizes, No. 1 weighing about 3000 pounds and making all sizes of nails from 1 inch No. 14 up to and including 3 inch No. 10, making 700 nails per minute of the smaller sizes, and producing 3000 pounds of 10d nails in 10 hours' running time. The No. 2 machine weighs about 1200 pounds and makes all sizes from the smallest No. 22 wire nail up to and including 2-inch No. 14 wire, making 1000 nails per minute of all sizes. One of the advantages claimed for this machine is that while it will produce a large quantity of good nails in a day, it is not run at a high rate of speed, No. 1 running at 140 and No. 2 at 200 revolutions per minute. The motions are all easy and the parts are not liable to wear so as to get out of order. The cutting-dies will work well for from four to six days, when they can be easily and quickly replaced.

Alloys of Aluminium.*

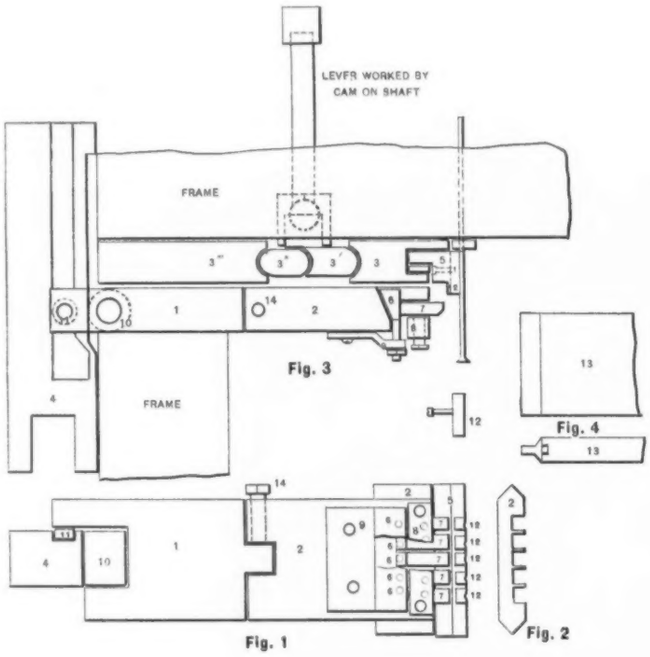
The most important alloys of aluminium are those made with copper. These alloys were first prepared by Dr. Percy, in England, and now give promise of being largely used. The alloy produced by the addition of 10 per cent. of aluminium to copper, the maximum amount that can be used to produce a satisfactory alloy, is known as aluminium bronze. Bronzes, however, are made which contain smaller amounts of aluminium, possessing in a degree the valuable properties of the 10 per cent. bronze. According to the percentage of aluminium up to 10 per cent., the color varies from red gold to pale yellow. The 10 per cent. alloy takes a fine polish, and has the color of jewellers' gold. The 5 per cent. alloy is not quite so hard, the color being very similar to that of pure gold. I am indebted to Prof. Roberts Austen for a splendid specimen of crystallized gold, as also for a mold in which the gold at the mint is usually cast, and in this I have had prepared ingots of the 10 and 5 per cent. alloy, so that a comparison may be made of the color of these with a gold ingot cast in the same mold, for the loan of which I have to thank Messrs. Johnson, Matthey & Co., all of which are before you. I have also ingots of the same size of pure aluminium, from which an idea of the relative weights of gold and aluminium may be obtained.

To arrive at perfection in the making of these alloys not only is it required that the aluminium used should be of good quality, but also that the copper must be of the very best obtainable. For this purpose only the best brands of Lake Superior copper should be used. Inferior brands of copper or any impurities in the alloy give poor results. The alloys all posses a good color, polish well, keep their color far better than all other copper alloys, are extremely malleable and ductile, can be worked either hot or cold, easily engraved; the higher grades have an elasticity exceeding steel, are easily cast into complicated objects, do not lose in remelting and are possessed of great strength, dependent, of course, on the purity and percentage of contained aluminium. The 10 per cent. alloy, when cast, has a tensile strength of between 70,000 and 80,000 pounds per square inch, but when hammered or worked the test exceeds 100,000 pounds. (A sample shown broke at 105,000 pounds.) An attempt to enumerate either the present uses or the possible future commercial value of these alloys is beyond my present purpose. I may, however, remark that they are not only adapted to take the place of bronze, brass and steel, but they so far surpass all of those metals, both physically and chemically, as to make their extended use assured. (Sheets, rods, tubes, wire and ingots shown.)

But even a more important use of aluminium seems to be its employment in the iron industry, of which it promises shortly to become a valuable factor, owing to certain effects which it produces when present even in the most minute proportions. Experiments are now being carried on at numerous iron and steel works in England, on the Continent and in America. The results so far attained are greatly at variance, for while in the majority of cases the improvements made have encouraged the continuance of the trials, in others the result has not been satisfactory. On this point I would wish to say to those who may contemplate making use of aluminium in this direction that it would be advisable before trying their experiments to ascertain whether the aluminium alloy they may purchase actually contains any aluminium at all, for some of the so-called aluminium alloys contain little or no aluminium, and this may doubtless account for the negative results obtained. Again, others contain such varying proportions of carbon, silicon and other impurities as to render their use highly objectionable. It seems to be a prevailing idea with some people that because aluminium is so light compared with iron that they cannot be directly alloyed, and, furthermore, that for the same reason alloys made by the direct melting together of the two metals would not be equal to an alloy where both metals are reduced together. Now, of course, this is not the case, and the statement has been put forward by those who were only able to make the alloys in one way. Aluminium added to molten iron and steel lowers their melting points, consequently increases the fluidity of the metal and causes it to run easily into molds and set there without entrapping air and other gases, which serve to form blow-holes and similar imperfections. It is already used by a large number of steel founders and seems to render the production of sound steel castings more certain and easy than is otherwise possible. One of the most remarkable applications of this property which aluminium possesses of lowering the melting-point of iron has been made use of by Mr. Nordenfelt in the production of castings of wrought-iron. Aluminium forms alloys with most other metals, and although each possess peculiar properties which in the future may be utilized, at present they are but little used.

In conclusion, I beg to call your attention to the wood models on the table, one being representative of aluminium, the other aluminium bronze. The originals of these models are now in the Paris exhibition, each weighing 1000 pounds. With regard to aluminium bronze I cannot speak positively, but the block of pure aluminium is undoubtedly the largest casting ever made in this most wonderful metal. I have to thank the directors of the Aluminium Company, and especially Mr. Castner, for furnishing me with the interesting series of specimens of raw and manufactured metal for illustrating my discourse.

* From a lecture delivered by Sir Henry Roscoe, before the Royal Institution of Great Britain.



DETAILS OF FIVE-WIRE NAIL MACHINE.

The new United States cruisers should be practically tested in long voyages at sea in actual service. Opportunity for unfair criticism is afforded so long as their exploits are confined to the sea-board, varied by an occasional trial of their amphibious qualities. A cotemporary, perhaps in a cynical spirit, says: "The Chicago was received from John Roach's assignees years ago, but she has not yet made a cruise; the Atlanta and the Boston were accepted before the Chicago, and have each made one short trip to the West Indies and have hung around home ports ever since; the Yorktown has been in commission several months, and she, too, is a home body."

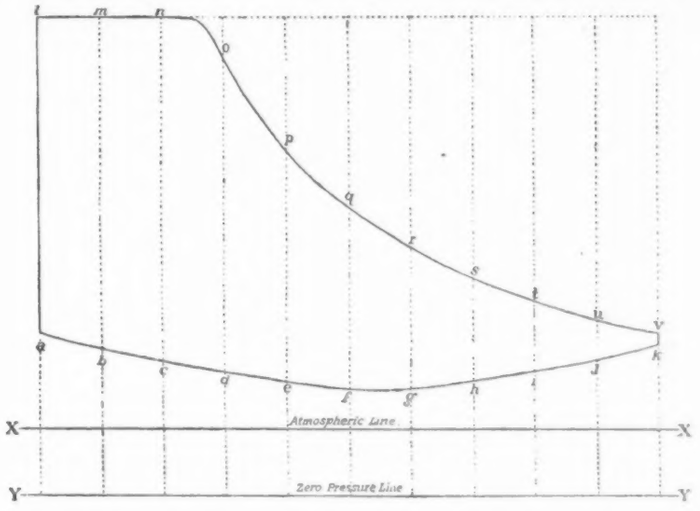
A new line of steamships is about to be put in the West India trade, the two lines already existing being unable to transport the freight offering. The Quebec line has been running for several years to the Windward Islands. The direct line to Trinidad started about four months ago, under a subsidy from the Colonial Government. The Anchor Line now has its opportunity, while American vessels are pressed with business in the coastwise trade. It is not long since the West India trade was done wholly by a fleet of American schooners.

The Worthington High-Duty Attachment.

In our issue of August 8 we illustrated and described the high-duty attachment to the Worthington pumping engine. In view of the wonderful simplicity of this attachment and its great efficiency we herewith present a most thorough and plain account of the duty it performs, taking our cuts and text from a lecture delivered before the class of mechanical engineering of Sibley College, Cornell University, by J. F. Holloway, past president of the American Society of Mechanical Engineers. After describing the compound condensing direct-acting duplex pump, Mr. Holloway said that the one needed improvement was some device or attachment by which steam-power could be stored up at the beginning of each stroke of the piston and given out again toward the end, in order to still further promote its economy. Such a device would, if properly constructed, permit the use of high-pressure steam at the commencement of each stroke, and of its being cut off during a portion of the stroke, thus enabling less steam to do the same work, and of course with a corresponding saving of fuel.

As illustrating the peculiar adaptation of this kind of pump for handling water, it may be said that an indicator card taken from the water end is practically a parallelogram. In order to produce such a card, in which no irregular lines reveal the irregular action of the power used in driving the pump, it is evident when driven by the direct force of the steam on the pump plunger the steam card must also be a parallelogram as well.

Now, were we to introduce steam in such a cylinder at the beginning of its stroke which was of a much higher pressure than was necessary to move the column of water the result would be an excessive pressure at that point on the water, which would not only distort the water-card and which would be shown by the indicator, but it would as well bring excessive shocks and strains upon the pump and its connecting pipes. On the other hand, to cut off the steam in the cylinder at any point during the stroke of the piston would be to reduce the power below the point necessary to move the water-column, and the pump would stop short of its full stroke.



The Worthington High-Duty Attachment.—Fig. 1.—Card from High-Pressure Cylinders.

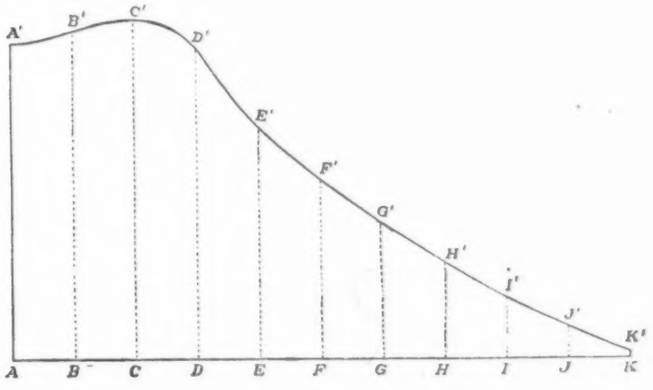


Fig. 2.—Showing Available Pressure at Each Point of Stroke.

This newly-invented and ingenious device, which is intended to permit the cutting off of the steam in the steam cylinder and its subsequent expansion, while at the same time the force exerted by the steam upon the pump-plunger shall remain uniform during the entire stroke, may be briefly described as follows: To the ordinary compound direct-acting steam-pump as usually built there is attached a plunger-rod which projects through the outer end of the pump chamber, and around which there is the usual stuffing-box for packing the same. On the end of this plunger-rod is fastened a cross-head which moves in guides that are bolted on the outer end of the pump. On this cross-head and opposite to each other are semicircular recesses.

On the guide-plates are cast two journal-boxes, one above and the other below the plunger-rod, both equidistant from it and at a point equal to the half stroke of the cross-head. In these journal-boxes are hung two short cylinders on trunnions, which permit the cylinders to swing backward and forward in unison with the motion of the plunger-rod. Within these swinging cylinders are plungers or rams, which pass through a stuffing-box on the end of the cylinder, and on their outer end they have a rounded projection which fits in the semicircular recesses in the cross-head, and, consequently, as the cross-head moves in or out of the pump it carries with it these two plungers, which, in turn, tilt the cylinders backward and forward.

These swinging cylinders are called "compensating cylinders," and they are filled with water, except when the pumping engines are used on oil lines, when they are filled with oil.

The pressure on the rams within the compensating cylinders is produced by connecting the compensating cylinders through their hollow trunnions with an accumulator, the ram of which moves up and down as the rams of the compensating cylinders move in and out. The accumulator used is of the differential type—that is, it has below a small cylinder filled with oil or water in which its ram moves, while above it has a much larger cylinder filled with air. On the top of the ram of the accumulator is an enlarged piston-head which fits closely in the air cylinder. So it will be seen, that the pressure per square inch on the ram of the accumulator will be the pressure of the air in the air cylinder per square inch, multiplied by the difference between the area of the air piston and the ram of the accumulator. This difference of areas is a matter of calculation based upon the particular service for which the pump is constructed. The pressure in the air cylinder is controlled by the pressure in the main delivery-pipe of the pump, as it is connected to the air chamber on the main delivery. The

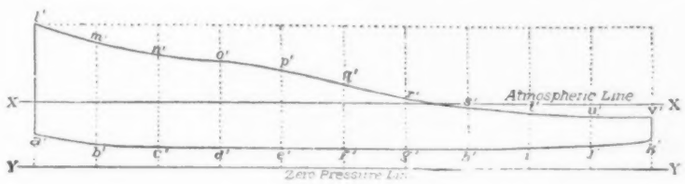


Fig. 3.—Card from Low-Pressure Cylinders.

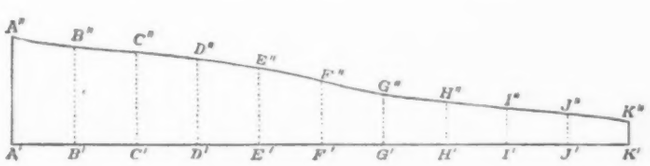
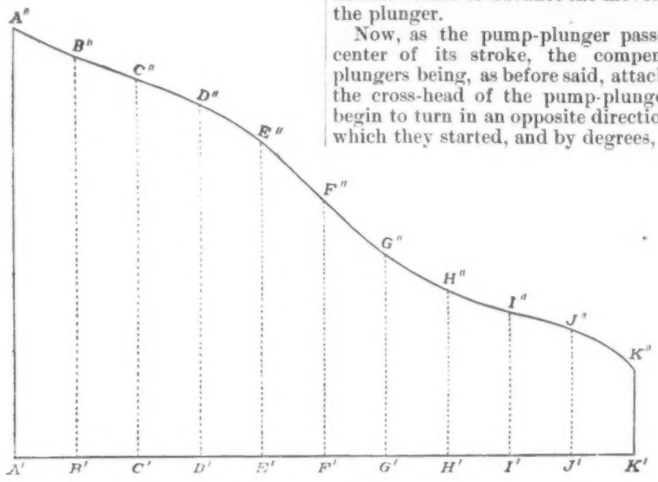


Fig. 4.—Available Pressure in Low-Pressure Cylinder.

peculiar and important effect this arrangement has on the operation and success of the "high-duty pumping engine" will be shown later on.



The Worthington High-Duty Attachment.—Fig. 5.—Low-Pressure Cylinder Multiplied Four Times.

Having described briefly the construction of this new and novel attachment to the direct-acting duplex pump, I will now describe as best I can without a model its effect on the operation of the pump.

We will suppose the pump about to begin its outward stroke. At this time the compensating cylinders (shown in Fig. 7) will be turned so as to point toward the outer end of the pump, with their plungers at the extreme point of their outward stroke, and at an acute angle with the pump plunger-rod, and with the full pressure of the accumulator load pushing them against the advance of the pump-plunger. As the pump-plunger begins its outward stroke each forward movement it makes changes the angle of the compensating plungers, until at one-half stroke the two plungers will stand exactly opposite each other and at right angles with the pump-plungers, and of course in a position where they can neither retard or advance the movement of the plunger.

Now, as the pump-plunger passes the center of its stroke, the compensating plungers being, as before said, attached to the cross-head of the pump-plunger-rod, begin to turn in an opposite direction from which they started, and by degrees, owing to the increasing acuteness of the angle they make with the plunger-rod, they begin to exert a power to push the pump-plunger along, whereas before and up to the half stroke they resisted the movement of the plunger. This pushing force increases constantly, until at the extreme end of the outward stroke, and when the accumulator-plungers are, as at the beginning, at their most acute angle, they exert their greatest force in helping to aid the pump-plunger in its outward movement. It is perhaps unnecessary to add that the return stroke of the pump is made under precisely the same conditions as the previous stroke.

If we were to convert the movements of the compensating plungers into a diagram which would illustrate the power they receive and give out we would have a curved line having a point at the half-stroke in which there would be no power exerted, while at one end would be shown a line of resistance above that zero line, which would be the exact result of that resistance at each point in the first half of the stroke; and it would also show on the last half of the stroke the same curve of power given out again. The peculiar shape of this curve (Fig. 7) is the result of carefully calculated arrangement of the details of construction, and it can be made to conform very close to the curve of the pressure line in the steam cylinder at almost any point of steam cut-off. Having now considered the pump end of a direct-acting steam-pump to which there is attached this new device for obtaining a high rate of fuel economy, we will now turn our attention to the behavior of the steam in the steam end of such a pump. We will assume that the pump is driven by compound cylinders in which the area of the expanding cylinder is four times that of the high-pressure cylinder. In attempting to describe the action of the steam force exerted on a direct-acting pump, I am embarrassed by the fact that I cannot produce before you drawings on the blackboard that will have to any considerable extent the accurate outlines of indicator cards. So you will be obliged to refer to the printed diagrams that have been distributed in the room.

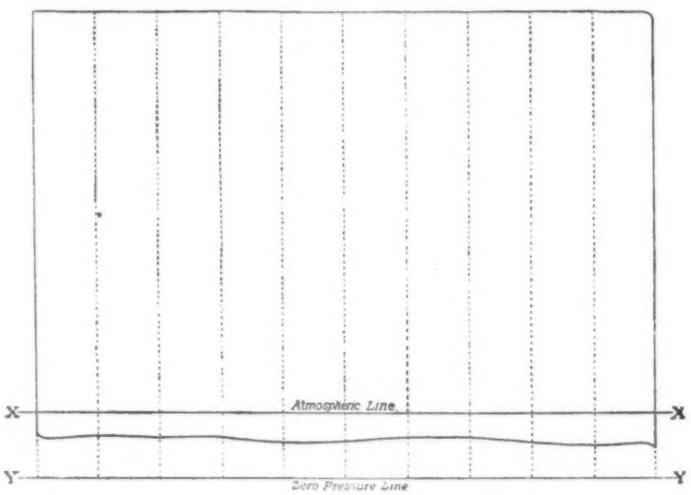


Fig. 9.—Card from Water-Cylinder.

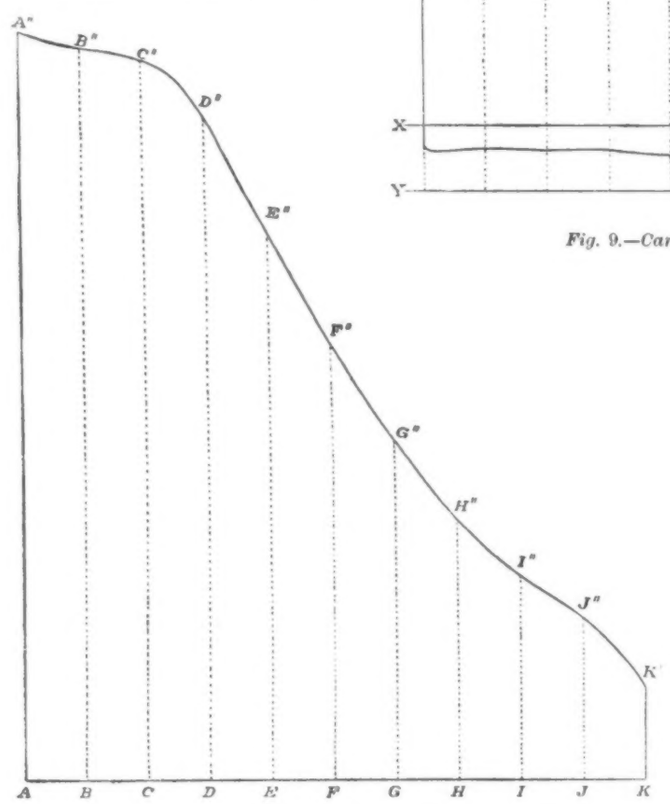


Fig. 6.—Total Pressure of Both Cylinders Combined.

Fig. 1 represents an indicator card taken from the high-pressure cylinders of such a pumping engine as we have under consideration. You see that the admission line is straight and perpendicular to the line of pressure; this is owing to the fact that in pumping engines of the kind we are describing there is a slight pause at the end of each stroke, which not only allows the pump-valves to seat themselves quietly, but it as well fills up the clearances and steam ports to the full steam pressure before the piston starts. In this diagram XX represents the line of the atmosphere and YY the line of the zero

pressure. The power exerted in this cylinder up to the point of cut-off and from that to the end of the stroke is shown by the line *l m n o p q r s t u v*, which is the steam line of one stroke of the piston. The return stroke is shown by the exhaust and compression line *k j i h g f e d c b a*. The resulting pressure in this cylinder will be the pressure above the line Y at each of the ordinates, less the back pressure at the same ordinate. If we take this resultant pressure and apply it to the same number of ordinates, all of which shall start from one common base-line, we will have a curved line which resembles Fig. 2, in which the line A′ B′ C′ D′ E′ F′ G′ H′ I′ J′ K′ will show the available steam-pressure at each part of the stroke of the piston.

In Fig. 3 we obtain by the same process the line of pressure in the expanding steam cylinder on the same number of ordinates, and from each ordinate of which we must, as before, subtract the back pressure above zero pressure. When we have done so we will have the total pressure-line of the expanding steam cylinder, as shown in Fig. 4. In order that we may make a comparison of the pressure in the expanding cylinder with the high-pressure card, we must multiply the total pressure shown on each ordinate by the ratio of the areas of the two cylinders, which in this case is four to one. This will produce the curved line shown on Fig. 5. Now that we have the line of pressure of each steam cylinder brought to the same basis we can add them both together and find at once what is the total pressure or power that both the steam pistons exert during each stroke of the pump, and also just what proportion of that power is exerted at each particular part of each stroke. This adding together of all the forces of a steam compound condensing engine, under the conditions previously described, will produce a card as shown in Fig. 6, a figure which at first glance would seem to be the furthest possible curve from what is required to move a pump-plunger which in its effect on a water-column is to show a card "vertical at each end and parallel on each side." It was for the purpose of producing this much-to-be-desired although seemingly impossible result that the high-duty attachment was invented, and, as I hope to show, has accomplished. In order that I may the better explain how this is brought about, we will draw a figure which shall represent the pressure of water on the pump above the atmosphere line, as well as the pressure, or as it is best known, the suction line below the atmosphere line, the total of which will be shown on Fig. 9, Fig. 8 being omitted as simply showing how these combined pressures are obtained.

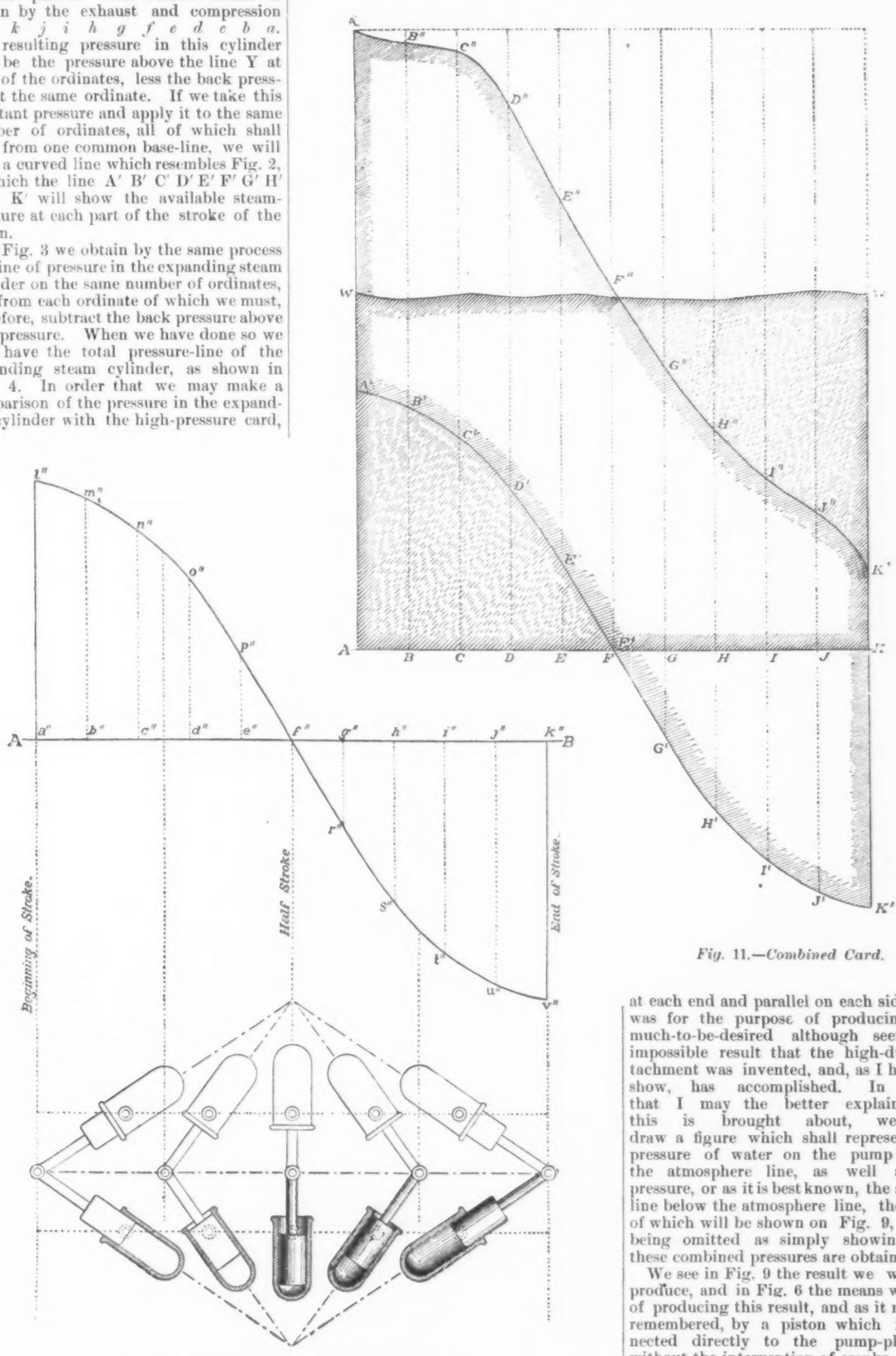


Fig. 7.—Compensating Cylinders and Diagram.

Fig. 11.—Combined Card.

We see in Fig. 9 the result we wish to produce, and in Fig. 6 the means we have of producing this result, and as it must be remembered, by a piston which is connected directly to the pump-plunger, without the intervention of cranks, shafts or fly-wheels. In order to make a graphic illustration of the difficulties to be overcome, as well as the means employed to overcome them, we will on top of this line of the water-card pressures and on the same base line draw the power or propulsion line, so that we can see how they fit each other.

This is shown by Fig. 11, in which A W W K is the outline of the water-load or pressure on the pump; or, as we may say, the resistance which is to be overcome, and A A″ K″ K is the outline of the force exercised by the steam cylinders during the same stroke as was shown by Fig. 6. The intermediate letters show the steam-power exercised at each part of the stroke, F″ F being the half-stroke of the pump. In looking on this arrangement of the two diagrams it will be seen that at the beginning of the stroke of the pump the steam-pressure is largely in excess of what is required to move the water, while at the end of the stroke it is far below what will be required to do so, and that it is only at the half-stroke that the steam-pressure and water-resistance are equal and that under the conditions as shown it is the only point where they would meet on equal terms. To put this high pressure of steam on the pump-plunger direct would at once and by a sudden jump raise the water-pressure far above the point shown, and with a shock the result of which it would be hard to estimate, while the fall of the steam-pressure, after it passes the center of the stroke, would soon bring the pump-plunger to a stop, which by its suddenness would produce a shock not unlike that at the beginning of the stroke.

Leaving for the time being this somewhat puzzling problem, we will again refer to the action of compensating cylinders, of an area of plunger and under a pressure of water that would adapt them to a pump operating under the pressure of steam and water resistance, as shown by the previously-given figures. This will be graphically shown by Fig. 7, in which the line A B is a neutral or no-pressure line, and the ordinates *a″ b″ c″ d″ e″ f″ g″ h″ i″ j″ k″* are equal divisions of the stroke corresponding with the ordinates shown on the steam-pressure cards, *f″* being in both instances at the half-stroke of the pump. The figures shown below the pressure diagram represent the position of the plunger cylinders at the beginning of the stroke, at one-quarter, one-half, three-quarters and full stroke, and also show what is the effect of the influence exerted by these cylinders at these varying points on the stroke of the pump.

At the beginning of the stroke *a″ l″* and when the accumulating plungers are at their outer stroke it will take an amount of power equal to *a″ l″* to push the plungers of the compensating cylinders in against the pressure that is on the end of them; as the plungers are driven in the angle of the inclination of the plungers to the center line of motion increases, and it takes less power to push them in, and, as a consequence, the line of the resistance is less and less at each ordinate, until we arrive at the half-stroke, where the plungers, standing at 90°, each being opposite the other, they are at a neutral line, where they exert no influence on the progress of the pump-plunger in any direction; but, as the plunger moves on, the compensating plungers, acted on by the pressure of the accumulator, begin to press outward, and as they leave the center perpendicular line they begin to exert an influence in helping to push the pump-plunger along, which influence constantly increases until the plunger arrives at the outer end of its stroke, when the plungers of the compensating cylinders give out their greatest force, and which is exactly the force put into them at the beginning of the stroke. This line of resistance and of impulse can be varied by changing certain features of the construction, but, as shown in the diagram, it is calculated to suit the steam-pressure and cut-off of the steam pump we have undertaken to describe.

Having constructed another and new line of curves, which show a retarding as well as an advancing effect on the power brought to bear on the pump, we will now trace its influence by placing this curve on the same water-card as we did the steam propulsion curve. This brings us back to Fig. 11, in which the line A K takes the place of the line A B, Fig. 7. Above and below this base base line we construct the same curved line as is shown in Fig. 7, and which crossing the same number of ordinates as have the other cards, shows exactly on each ordinate the influence it exerts on the pump at that particular point of its stroke. With this diagram before us, in which is seen first the amount of power required to move the water column at a steady, uniform pressure through one stroke of the pump, and in which we have the steam-pressure line which is to move it, and also the line of useful effect of the compensating cylinder, we will now examine what is the combined effect of all these forces. We will assume that the left-hand vertical line is the beginning of an outward stroke of the pump, just as we have assumed for a previous outward stroke. We see at the very start that the line A W is the amount of power required to move the water, but we have the line A W A″ as the steam-power we have put on the pump at this point, and we see that the power inclosed within the lines W A″ B″ C″ D″ E″ F″ is just so much more power than we want. Now, if we look at the lower left-hand corner we will see that the space inclosed between the lines A A′ B′ C′ D′ E′ F and F E D C B A represents the amount of steam it takes to push in the plungers of the accumulating cylinder, and it adds just that amount of resistance to the advance of the plunger. At F′ F″ we have arrived at the half-stroke, and here we find the steam-pressure is just equal to the resistance of the load or head of water on the pump; but as we pass this point on to the end of the stroke we find that the area inclosed within the lines F′ W K′ J″ I″ H″ G″ represents the amount of power which by reason of the expansion of the steam (which in the pumping engine described is 16 to 1) falls below what is required to do the work. It is at this point that the compensating cylinders come to the rescue and give out the power which by reason of the high steam used at the beginning of the stroke was stored up in them, and the space inclosed within the lines F G H I J K and K′ J′ I′ H′ G′ F′ represents the stored-up power they now give out.

As the diagram is now constructed the space inclosed between the two curved lines would represent the total net power exerted by the steam direct, as well as through the compensating cylinders, while the space inclosed within the parallelogram represents the resistance to be overcome in moving the water-column. Now, if you will measure the length of any one of these ordinates between the curved lines, and which represents the power exercised at that particular part of the stroke, you will find that it exceeds but a very little the resistance of the pump-plunger at the same point, the excess of the power being just what is required to keep up the speed of the pump.

While I have perhaps described this new and beautiful invention with a minuteness that was unnecessary, I have done so under the impression that there are many persons who look upon these engines when in use who have no clear idea of the functions performed by the compensating cylinders, and who know of the exceedingly high duty they give, but without an idea as to how such a result is brought about, and for the further reason that the literature on this subject is as yet very meager.

In addition to the surprising manner in which this "high-duty attachment" fulfills the seemingly last and only want of the direct-acting steam-pump to enable it to become the steam pumping-engine of the future, there are other reasons why the use of compensating cylinders are exceedingly desirable. While it has been shown they perform equally well the functions of heavy fly-wheels in distributing the power applied equally through the entire length of the stroke, they do so by using far less material in their construction and by occupying far less space. There are now pumping engines in use in which the compensating cylinders and their attachments do not weigh 4000 pounds, and where it would require, in order to produce equally satisfactory results in a rotating engine, a fly-wheel which would have to be 20 feet in diameter and weigh 100,000 pounds.

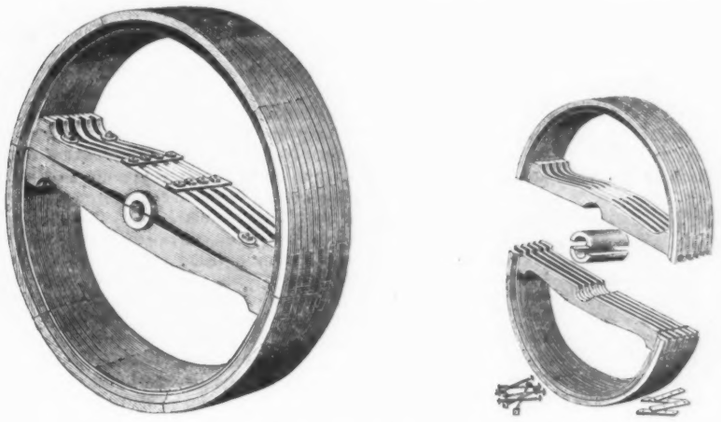
Another and equally important feature connected with the use of compensating cylinders is that they produce equally good results when the pump is moving at low speeds as when moving at high speeds, while it is well known that when a fly-wheel is employed in connection with pumping it only produces its best results when run at the one particular speed for which it was designed, and when for any reason the pump is run at a lower speed the usefulness of the pump is impaired just in proportion as the speed decreases. There is also in the use of the device described an element of safety which is of much value. In a fly-wheel pump, if at any time when the pump is working up to its maximum speed an accident takes place, such as the bursting of a pipe or the blowing out of a joint and the pressure is suddenly released, the fly-wheel, by reason of the mass of metal in its rim and with its stored-up power, instantly starts off at a speed which, unchecked by the attending engineer, would soon produce disaster. When compensating cylinders are used they derive their power through the accumulator, which in turn is connected with and derives its power from the pressure in the main delivery pipe. Now, if the pressure in the main pipes should suddenly drop by reason of a breaking of pipes the pumping-engine would at once stop, for the reason that it has no mass of metal in motion to impel it forward, and for the further reason that the power of the accumulator would be gone, and the action of its own valves would shut off the steam.

Iron-Making in Rhode Island.—In a letter to the Boston *Herald*, George M. Rice, president of the Worcester Steel Works, writes: "There is in Rhode Island and perhaps in Massachusetts a very large supply of the best coal for smelting iron ore mined in this country or any other country. There is also a mountain of iron ore, apparently inexhaustible, of the very best material for making steel. During the war of 1812 it was used for making cannon, and they proved of great strength. A few months will be likely to demonstrate the facts in this statement. Pig-iron can be made at Portsmouth, R. I., cheaper than it can be made in Pennsylvania or in any part of the country except Alabama and Tennessee. The pig-iron made in those States is not suitable for making the best steel, being so high in phosphorus and sulphur, while that of Rhode Island is very low in phosphorus and sulphur. The Rhode Island coal has some fluxing properties, increasing its value. If the people in New England had devoted a portion of their enterprise to developing iron and coal interests, instead of doing so much in cotton and wool, a very different view would have been taken by parties who are interested in its prosperity. We are using this coal under our boilers for making steam and in our cupola with a great saving in cost and quite to our satisfaction. The work of our most famous geologists,

Professors Jackson, Sillman and others will fully confirm all I say about coal and iron. Theirs was theory, ours is practice positive."

The Reeves Wood Split Pulley.

The Reeves Pulley Company, of Columbus, Ind., are just placing upon the market a new type of wood split pulley illustrated herewith. They state that the materials used in forming both the arms and segments for the rims are all of an exact thickness, and in building same the arms are firmly glued and nailed in each alternate layer, thereby making each half of the pulley one solid structure, and entirely obviating the use of any kind of arm fastening, which latter has always been considered as being an objectionable feature in this class of pulley. The bushing used in these pulleys permits of any regular size being placed upon any ordinary-sized shaft. It is claimed that these pulleys are much lighter than those of iron or steel; they can be conveniently placed in position without removing the shaft, the principle of compression being used in securing the pulley to the latter, and producing an equal contact with the shaft at all points; that there is a gain in the transmission of power through their use by reason of the stronger grip obtained by the belt; no set-screws or keys are necessary, and that, finally, it is impossible to injure the shafting.



The Reeves Wood Split Pulley.

Proposals for Five Steel Cruisers.

On the 22d inst. the Navy Department opened bids for the construction of five steel cruisers, three of them to be about 2000 tons, and two 3000 tons displacement. The proposals were divided into four classes; first, for the vessels complete according to the Department's designs; second, for the vessels complete on the contractors's designs; third, for the hulls upon the Department's designs and the machinery upon the contractor's designs, and, fourth, for the construction of the machinery upon the Department's plans and of the hulls after the contractor's ideas. The small vessels are to exhibit a maximum speed of at least 18 knots for four consecutive hours, with premiums in case of an excess and deduction in case of failure to attain this speed. The vessels are to be completed in two years, and are not to exceed $700,000 each in cost. If they fail to attain 16½ knots they will be rejected. In the case of the two 3000-ton vessels a speed of 19 knots is required, these vessels not to cost more than $1,100,000. In the first case a bonus of $10,000 is offered for the first quarter knot over the requirement, and this is increased up to $40,000 for the fourth, fifth and sixth quarter knots. In the second case a bonus of $50,000 is offered for each quarter knot over the 19 required. The bids were as follows:

The Bath Iron Works, of Maine, propose to build the three 2000-ton vessels for $780,000, but with the addition of six months to the advertised time (two years); Cramp & Son, of Philadelphia, proposed to build the same vessels at $875,000 each, and the two 3000-ton vessels at $1,225,000 each. As these prices exceed the appropriations, the work will probably be readvertised or Congress will be asked to increase the amounts.

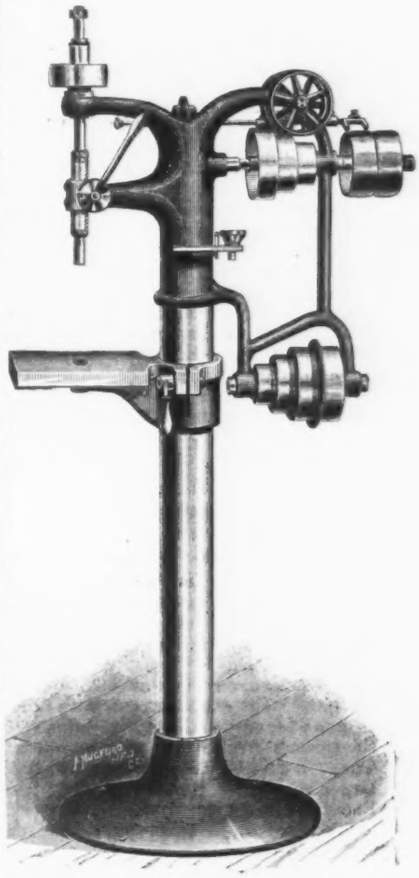
Long Credits and Cut Prices.

A convention of merchants was held in Hamilton, Canada, last week, at which resolutions were passed condemning the system of easy credits. Facilities extended by the banks are supposed to foster reckless trading. Furthermore, the system of selling through travelers is charged with much of the responsibility for the inordinate competition prevalent. In former times, when the bulk of the buying was done by retailers in the wholesale warehouse, greater caution and prudence were exercised in assuming liabilities, and less pressure to purchase was put upon the customer, while now the traveler in his anxiety to book an order never wearies of commending his wares and persuading the retailer to lay in a large stock, offering as inducements long credits and low prices. One cut in price is followed by another until goods are actually sold below cost in order to retain the customer and obtain paper with which to finance. Reviewing the subject, the Montreal *Gazette* says: "It is necessary, first of all, to lessen the risk of bankruptcy, and that can best be done by the exercise of discrimination by wholesalers in the sale of goods and by reducing credits. Wholesalers are principally responsible for demoralization in retail trade produced by excessive competition, compromises and easy credits, and they, rather than the retailers, must devise and apply the remedy."

Judgments for $58,516 have been entered against Comegys & Lewis, contractors, at No. 15 Cortlandt street, New York, in favor of the following creditors: Shickle Harrison & Howard Iron Company, of St. Louis, $26,635; Wing & Evans, $15,635; Coffin & Stanton, $11,955; Thomson-Houston Electric Company, $3128, and Penn Iron Company, $1163. Execution was issued to the Sheriff, but it is said there was nothing attachable to levy upon. Messrs. Comegys & Lewis have been in business for about ten years, principally as water-works contractors. Mr. Lewis is at present in Chili, from which Government the firm about a year ago obtained a contract to extend the railroad system, for, it is said, $17,000,000. The North and South American Construction Company were formed to carry out the contract. In explanation of the judgments the representative of the firm said that they were taken with a view of settling up the partnership of Comegys & Lewis. The firm would be dissolved and Mr. Comegys would continue the water-works business on his own account.

New Sensitive Drill.

The drill of which we present an engraving is manufactured by W. P. Norton, of Bristol, Conn., for whom the Prentiss Tool and Supply Company, of 115 Liberty street, New York, are the agents. The drill is designed for all classes of light, sensitive and rapid drilling. It is adapted for drilling holes from 0 to ½ inch and to the center of 12 inches, being from the face of the column to the center of the spindle 6½ inches; in depth it will drill without readjustment of the table or work 4 inches; in hight it will admit work up to 33 inches. Each drill is provided with a bell center for insertion in the table to receive the lower end of shaft to be centered, there being an index line on the column to insure its accurate lining with the spindle. It is claimed that in sensitiveness the drill is unsurpassed, the spindle being balanced by a special coiled spring so arranged as to secure a perfect balance, and is provided with an adjustment for preserving the same when chucks or other tools are attached to spindle. The table is balanced by a weight in the center of the column that allows the table to be freely



New Sensitive Drill.

swung around the column at any point or adjusted vertically with ease and without the slightest danger of falling. All the manipulations about the drill can be accomplished from the front of the machine, so that there is no need for the operator to change his position in shifting the belt, adjusting the table or any other movement. On the spindle is an adjustable collar, which is convenient when drilling to depth or counter-boring.

NOTES OF THE ELECTRIC LIGHT CONVENTION.

In welcoming the association, W. C. Ely, of Niagara Falls, described a plan which he said solved the problem of

UTILIZING THE POWER OF NIAGARA.

From the water-level in the chasm below the falls it is proposed to excavate a tunnel 24 feet in diameter, extending under the village eastwardly at an ascending grade of 1 foot in 100 feet, which tunnel will approach within 400 feet of the river, just east of the present hydraulic canal and at that point will be 125 feet below the surface of the land and the waters of the upper river; thence it will extend eastwardly with a slightly modified grade and parallel with the river about 1½ miles, and at its easterly termination will still be 90 feet below the surface and in diameter 10 feet, the same having been gradually narrowed to that limit in the last 1½ miles of its length. This tunnel will serve as a tail race simply to discharge water. Immediately over and above this tunnel will be constructed lateral tunnels at right angles with the river and the main tunnel, and arranged to discharge into the latter. Over and above the lateral tunnels, and, like them, at right angles with the river and main tunnel and upon the surface of the land, will be excavated surface canals, into which will be diverted the waters of the river. By the side of these canals, wheel-pits can then be excavated and into them turbine-wheels placed at a depth of 100 feet below the surface of the land, and arranged to discharge directly into the lateral tunnels below, and thence through the main tunnel or tail-race and into the gorge of the river below the falls. This system of transverse canals and tunnels would discharge 864,000 cubic feet of water per minute, and furnish 119,000 horse-power.

We take the following from a paper by M. D. Law on

THE PERFECT ARC CENTRAL STATION.

Electric lighting is one of the hardest kinds of work for a steam engine, the continuous running and the work being thrown on and off instantaneously causing immense strains. They should be twin engines connected at right angles, by which we have steadier power than with single engines, because we have the impulse of the steam at every quarter of a revolution. They should be built specially and have a larger amount of iron in all their parts than is used in an ordinary commercial engine, so that in times of trouble they can be forced for a short time beyond their ordinary load. For a 1000-light station there should be two 23 x 48 inch twin engines running at a speed of from 70 to 80 revolutions. With this number and size of engines there will be a reserve of one engine, as the three engines will easily carry the load of 1000 lights with economy. It is a settled fact that the Corliss type of non-conducting engines, properly constructed and handled, are the most economical, using less than 2½ pounds of coal per horse-power hour, working at 110 to 115 pounds of steam per square inch. High rotative speed is not necessary for electric lighting, but it does require a steady and uniform speed. An engine running 40 revolutions per minute, provided the speed is regular, will make as good lights as one running 300 revolutions. It has been practically demonstrated in a great number of plants which have used the small, high-rotative speed engines that such is the fact, the low speed using less coal, oil and attention, while the cost for repairs is very much less, as well as loss of steam from radiation, clearances, &c., than high-speed engines. On a pair of Corliss engines 23 x 48 inches, at 75 revolutions per minute, running day and night for nearly seven years, the actual cost for repairs was but $25, and during that time they were shut down but once on account of breakage, and then only ten minutes, to disconnect one engine, the other being run with the load of both at increased steam-pressure.

Regarding the

VELOCITY OF ELECTRICITY

Professor Anthony said: "In the first place, in regard to the velocity of electricity, Dr. Fell made the remark that it was well known that Wheatstone demonstrated that the velocity of electricity was 280,000 miles per second. All of us know that such experiments were unreliable, and that it is now perfectly well understood that it was not the velocity of electricity at all, but simply the time required for those wires to be charged, and for a spark to leap across the gap between the two wires. The velocity with which electricity passes over any given conductor is not known, and we know that that velocity depends upon a thousand things. In the first place, it depends upon the conductivity of the conductor; in the second place, upon the amount of pressure or potential, and upon many other things, The fact is that in the nerves of the human body the velocity of the electrical current is known to be immensely less than it is in a metallic wire. In a wet string the velocity of the current in passing over even a space of a few feet is readily measureable, requiring quite a large fraction of a second to pass over a distance of even a few feet. I merely speak of this matter that it may go upon record, if these discussions are to be reported, that this question of the velocity of electricity cannot settle the point as to whether death by electricity would be painless or not.

The following table gives an idea of the extent of the

ELECTRIC STREET RAILROADS.

Years. Showing growth of roads.	Number of electric railways.	Number of miles of road.	Number of cars.
1885	3	7.5	13
1886	5	28	39
1887	?	29	81
1888	33	130.5	265
January 1 to July 1, 1889:			
Operating	19	113	174
Building	42	267	364
Totals	109	575	936

The nature of

THE STORAGE BATTERY

was thus described by Wm. Bracken: "There is a very general popular misconception of the nature of the storage battery. I suppose that at least 90 per cent. of the public have an idea that storage batteries are nothing but buckets full of electricity. We read in the newspapers from time to time of storage-battery cars carrying "tin tanks" filled with electricity. There can be no greater misconception of the nature of the storage battery. The clearest idea I can give you of the energy contained in a storage battery is to compare it with a lump of coal. The source of energy in a battery is identical with that contained in coal. It is merely energy locked up in a number of substances, principally the metals, which, when set free in a certain manner, manifests itself in a certain phenomenon we call an electric current. The metal almost universally used in the storage battery is lead in its various forms. In this lead is contained latent energy, the same as in coal, and if we compare the amount of work accomplished by the energy from either source in foot-pounds we will find it to be exactly equal in both cases. Now, the general principles involved in a storage battery are very simple. When we charge a battery from a dynamo or other external source of electricity we are manufacturing lead, and when we discharge a battery through an electric motor or series of lamps we are simply burning lead. But there is this difference between the action of coal and lead, that whereas coal apparently disappears when burnt the lead does not, but is converted into sulphate of lead to be converted back to metallic lead again by a reversal of the current, so that the storage battery is alternately burning and reducing lead to and from one of its salts. This is why the storage battery lasts and does not disappear in the extraction of the energy, as coal apparently does. In fact, the storage battery is an ideal illustration of the conservation of force and the indestructibility of matter.

"The cost of motive power for a car-day of 75 miles we estimate at $3.40, as against $7.50 for horses. Five dollars for 75 miles ought to cover the cost in winter. By motive power we mean the cost of energy at 2 cents per horse-power hour, and $700 per annum for maintenance of batteries and motors. To those who may think that 2 cents per horse-power is a low estimate it may be said that power has been offered in New York, to be delivered at our station, at the price above named. In towns outside of New York offers have been made to supply current at lower figures. The more level the road the cheaper obviously will be the cost of motive power. This is more particularly true of the storage battery, which in excessively steep and long grades becomes heated. The chemical energy, instead of exhibiting itself in the form of electrical energy, exhibits itself in the form of heat, with consequent injury to the battery. Cars will ascend very steep grades, but it is not deemed economical to attempt grades of more than 6 per cent., and they must be short at that rate. Each car has two sets of battery. A set is easily charged in about two-thirds of the time the other is in service. No time is lost in charging, as the battery is automatically put in circuit with the dynamo as soon as it is withdrawn from the car."

Speaking of

DANGER FROM FIRE

in the station, Mr. Law said that his wires were as thoroughly insulated as possible; that there was a good fire-pump easy of access, plenty of hose and an ample supply of fire-buckets distributed about the place, and that the latter were kept filled.

A member reported that he had no fire-buckets in his station, but he did have stand-pipes with hose always attached, so that a man simply with a turn of his wrist has the water into the hose immediately. He did not have to stop to couple on the hose or put on the nozzle.

Another member said: "We do even better than that. Our hose is so arranged that when it is run off the reel it turns on the water automatically."

The electric-power plant

ON THE COMSTOCK LODE

was briefly summarized by Prof. E. P. Roberts, in his paper on "Electrical Transmission of Power." At that point are six 120 horse-power generators operating six 80 horse-power motors. You will remember that each generator drives one motor; that each generator is driven by a Pelton water-wheel placed upon the shaft of the dynamo; that the wheels are actuated by water falling 1680 feet, giving a pressure of 700 pounds to the square inch. Each wheel is controlled by a governor designed by W. B. Devereaux and his brother, J. H. Devereaux, of Aspen, Col. Mr. J. E. Smith adjusted the governor at the mines. The generators run at 900 revolutions, all are independently driven, as before stated, and the motors turn 850 revolutions per minute, and all drive to the same shaft. An interesting feature is that to this same shaft is geared a surface water wheel and the water which actuates it, after passing it, drops one-third of a mile, and in losing the potential energy it had at the power-house it develops dynamic energy by two transformations back at the same point, and adds it to the small amount of dynamic energy it there developed. The working out of the electrical mechanism to accomplish the above result is of great interest, particularly when we find it so successfully accomplished that orders are being given for similar apparatus for other mines, as well as for electrical railroad work and manufactories. A case of poetical justice has occurred in this line. The large Calumet and Hecla mines are about to erect five of these motors to assist in the production of copper, and thus electricity will assist to mine its chief servant, copper, as well as, in many cases, to refine it.

THE NARRAGANSETT ELECTRIC-LIGHT ENGINE.

The engine employed at the new central station of the Narragansett Electric Lighting Station, at Providence, was thus described by J. T. Henthorn and C. R. Remington:

The engine, which is of the triple-expansion type, was especially designed for the service of the station by E. Reynolds, general superintendent of E. P. Allis & Co., of Milwaukee, Wis. The high-pressure cylinder of the engine is 14 inches in diameter, the intermediate cylinder 25 inches in diameter, and the low-pressure cylinder 33 inches in diameter, each 48-inch stroke. The working barrels of each cylinder, together with the heads, are thoroughly jacketed with steam at boiler pressure; also the receiver between the high and intermediate cylinders and that between the intermediate and low-pressure cylinders are likewise jacketed by steam at boiler pressure. The valves of the cylinders are located in the heads, and as the working face of the valve with this construction is within a very short distance from the face of the heads, the waste clearances are reduced to a minimum. The valve-gear is of the liberating type, the valves themselves closing by vacuum-pots located level with the engine-room floor. The automatic cut-off mechanism of the first and intermediate cylinders is actuated by and under the control of the governor, and at the same time the point of cut-off of the intermediate cylinder may be set at a fixed point independent of the governor if it is so desired, while for the large cylinder the point of cut off is fixed by hand adjustment and always independent of the action of the governor, and thus a perfect means is afforded to adjust the ratio of expansion relatively in each cylinder and effect the greatest possible economy of steam, and consequently fuel. For the first and intermediate cylinders one eccentric is employed to operate their valve-gear, and for the large cylinder one eccentric is used to operate the two steam-valves, and one for the two exhaust-valves, the object and advantage of this arrangement being to obtain any amount of compression that may be found desirable independent of the action of the steam-valve.

The diameter of the main driving-wheel is 17 feet and it has 45-inch face, made in segments, and carrying a 44-inch double belt made by C. A. Schieren & Co., of New York. The jackets of the two receivers and of the three steam cylinders are drained by a pump 3 inches in diameter and 5-inch stroke, operated from the condenser of the engine, the water being pumped into the feed-pipe. The frame of the engine is one peculiar to the builders, and was first designed for heavy rolling-mill practice, and consists of strong wrought-iron bars or rods running from the cylinder-head to the pillow-block. The rods tie these two parts together and at the same time form a part of the guide-rod for the horizontal cross-head. From each cross-head extend two hammered-iron piston-rods for the intermediate cylinder and large cylinder and for the small cylinder one rod passes through the back head of the intermediate. The speed of the engine is 100 revolutions per minute. To provide efficient lubrication for the main bearings a positive oil circulation is produced by a pump operated from the valve-gear rocker-shaft.

American Engineers in Derby.

So much has been written about the recent visit of the American engineers to England and the Paris Exposition, and also about the week spent in Germany, that it would seem there was little left to describe. But at this late hour, when most of us are safely returned to our homes in America and the engineers' trip abroad is rapidly fading into a pleasant memory, an editor of high repute writes to a member of the party asking him for a description of the Derby trip—almost, if not quite, the last of the pleasant happenings on the other side to a number of the travelers.

The member referred to above is no longer a tourist spending his holiday in the study of massive docks, ship canals, machine-shops, or the wonders of the exposition, but the hard-working head of a manufacturing company battling with the piled-up accumulations of his recent holiday. So he, in his turn, asks another member of the party present at the Derby entertainment to write for him, hinting placidly that the learned pages of this weighty paper have no space for any frivolities that might drop from the pen of one whose sole claim to notice is that she once married an engineer.

Now that her pen is no longer weighted with this preamble, it glides immediately into St. Pancras Station, one of if not the most beautiful and perfect of its kind. There our train awaited us Monday morning, July 22, and there about 25 of our scattered party were gathered together from all parts of England and the Continent, to accept at last the exceeding great hospitality of the Midland Railway. Early in our journey, in fact on our arrival in Liverpool, the first days of June, an invitation to the whole party of 300 or more had been given to visit the shops at Derby and use the Midland road for transportation to London. But through some unfortunate mistake this invitation was either not received or not answered in time; other arrangements were made for us, and too late we heard of the pleasure that had been provided for us.

Notwithstanding this *faux pas*, our kind hosts sent another cordial and urgent invitation to as many of the party as might be *en route* to Liverpool at this later date to stop at Derby, inspect the works there, and also partake of a lunch. So the few favored ones, accompanied by several of the officers of the British Institution of Civil Engineers, rolled smoothly out of St. Pancras Station that pleasant Monday morning with all sorts of happy anticipations and but one regret, viz., that this was our last merry-making in dear old England.

To eyes accustomed to the vast tracts of wild uncultivated country through which the railroad finds its way in our western land, England seems like one large garden or park. The pretty stations, with their trim flower borders; the smoothly sodded slopes on either side when the road is laid through a cutting; the near or distant farm buildings so solid and substantial; the air of comfort over the whole cleared-up-and-put-in-order country, and, above all, the soft, misty and yet vivid green of grass, trees and hedges, are so refreshing, so restful, so beautiful in their suggestions of a manner of living so different from our own.

Why is it in all new countries that the beautiful must be ruled out, and only the useful recognized? While asking that question, before the engineer opposite me can answer in the exhaustive and crushing manner peculiar to the profession, the train stops. We are in Derby and several officers of the road are waiting on the platform to receive us and escort us to the hotel close by, belonging to the Midland Company, where lunch is served—the most tempting lunch that ever hungry traveler beheld. In a large, airy room, the windows of which are filled with flowers and further decorated with English and American flags, stands an oval table and the flowers on this table are so beautiful that we forget for the moment that we are hungry. Skillful fingers must have piled those lovely roses in the center and laid around the edges of the table the broad band of flowers, the colors so harmoniously blended that the whole effect is perfect. But a pretty *menu* by each plate reminds us that turtle, lobster, roast chicken and quail possess a charm of their own. Let me not forget the Bakewell tarts! If the honorable gentleman at the head of the table did not hesitate to recommend them to the consideration of our distinguished engineers, why should my poor pen hesitate to write that the Bakewell is the queen of tarts, fit for the palates of Midland officers and their guests.

Up to this point I write of what I've seen with my own eyes, and I would fain linger over this delicious lunch, the toasts, few but bright and witty, and the replies, where the speakers, one and all, felt that somebody else would do it so much better. This was impossible, and yet when a post-prandial speech contains such original ideas it deserves honorary mention if nothing more. Now, while the engineers are conducted through all the various works of the railway—the chemical laboratory, drafting-room, machine-shop, pattern-shop, carriage-factory—and are delighted with all they see, the few ladies of the party are invited to go up stairs and look at things quite as interesting in their way. We see the president's sanctum, the directors' room, with its large table and many arm-chairs, the portraits of all or nearly all the officers of the road, and last, but not least, the stockholders' room, where dividends are declared, and where—I had it from the highest authority—only extreme cheerfulness reigns. As stockholders are never cheerful when the dividend is a small one, the status of the Midland Railway may be determined from this. If further proof is required, look at the great map that an attendant unrolls before our admiring eyes. The Midland and its branches are shown by broad black lines, intersecting

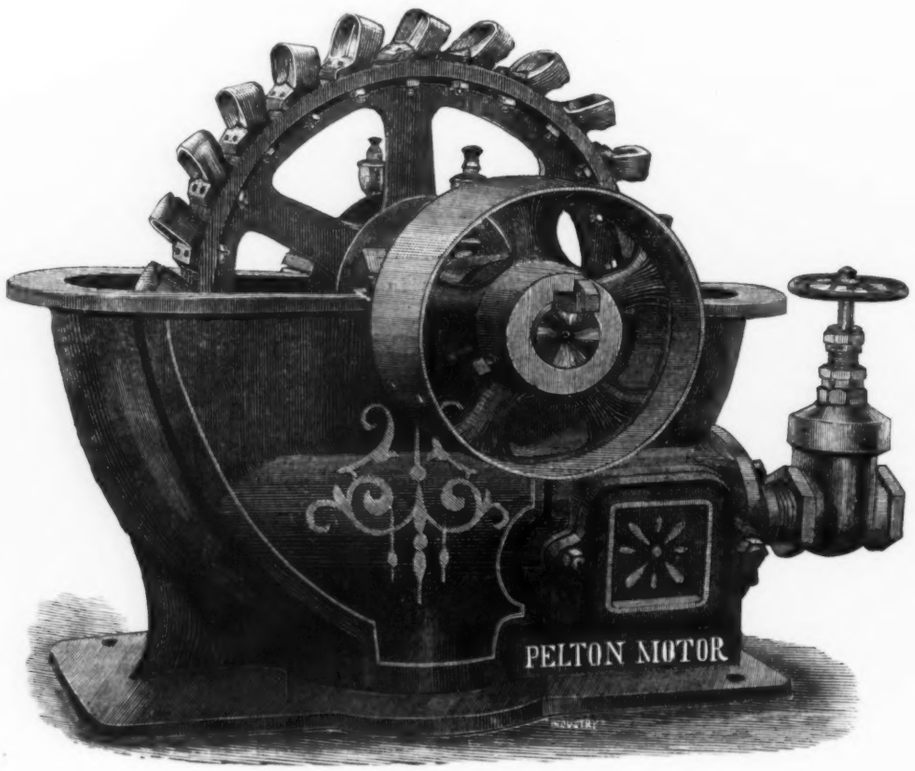
the whole of England, while all other roads have the faint narrow marks their feebleness and incapacity require.

Everything has an ending, and both the day spent in Derby and this paper are no exceptions to so general a rule. We bid our kind friends good-bye, and in a comfortable carriage attached to the 3 p.m. train are whirled rapidly to Liverpool, through a country more picturesque than any we have yet seen in England.

C. H. S.

The Pelton Water-Wheel.

The remarkable efficiency of this wheel and its extremely simple construction have made it famous as a water-motor. It consists simply of a wheel upon the periphery of which are secured many small buckets, as shown in the accompanying engraving. The water issuing from the nozzle, shown



THE PELTON WATER-WHEEL.

at the right in the engraving, strikes the buckets tangentially and imparts a rotary motion to the wheel. The shaft is provided with a pulley for the transmission of power. This constitutes the entire apparatus.

An important feature peculiar to this wheel is the fact that the same size can be made to develop different powers by changing or regulating the amount of water discharged against the buckets. This practically amounts to throttling the water and permits of obtaining a wide variation of power without any loss of efficiency in the wheel. The wheel shown in the cut, in which the upper half of the cover is removed in order to show the arrangement of the buckets, is known as an 18-inch No. 4. When this wheel is used with a low head of water—20 feet or under—the needed power can be obtained by using two or more nozzles, or two wheels may be mounted on the same shaft. Even under these conditions, which are not favorable to the best working of the wheel, the efficiency is remarkable; but with high heads the wheel will develop from 85 to 92 per cent. of the total power of the falling water. Instances are cited where these wheels have run for years without needing even the slightest repair. This is evident from the fact that the shaft and its bearing are the only points where it is possible for any wear to take place, as the wheel is subject to no wear except when water containing sand is used. Should the buckets wear from this cause they can be easily replaced. The wheel can be provided with governors, which afford a close regulation of speed under varying loads. These motors are made by the Pelton Water Wheel Company, of San Francisco, Cal.

The Pencoyd Iron Works.

The Philadelphia *Ledger* is authority for the statement that the Pencoyd Iron Works have under consideration plans for the establishment of an additional plant elsewhere than in the immediate neighborhood of the present establishment. To this will be moved the heavier of the present rolling-mills, the design of the improvement being to materially increase the present facilities and afford greater convenience in the handling of the product. The present large plant is an outgrowth of a small mill started by Algernon and Percival Roberts in 1852, with a capital of $8000, when the work was begun with one old-fashioned second-hand trip hammer, which was procured from James Rowland's works in Kensington. The firm began by making solid wrought-iron anvils and vises, and soon after commenced on railroad-car axles. Mr. Theodore Roberts soon after became a member of the firm, from which he retired several years later, when Percival Roberts, Jr., took his place. At first about 15 or 20 men were employed, and the product was transported from the works to the city in wagons, and all coal used w s hauled by the same method. At present there are upward of 1700 hands employed, whose wages monthly amount to $75,000. Over 60,000 tons of product, including bridge-work, are turned out each year.

The Messrs. Roberts were, it is said, as a corporation, the original wrought iron bridge company in this country. The work of constructing iron bridges, under Squire Whipple's patent, of New York, was commenced by them in 1857, when George B. Roberts, president of the Pennsylvania Railroad Company, and Levi Line were associated with the firm. The first bridges built were for the United States Government, and were shipped to the Indian Territory. Part of the way they were transported by pack mules to their destination. John W. Murphy, a graduate of the Polytechnic School, at Troy, was engaged by the company as their chief bridge engineer. Notwithstanding the rapid growth of the Pencoyd Iron Works since its establishment, its present capacity is too small to meet the demands, and the compa ny are only terred from making the necessary enlargements for want of ground upon which to construct suitable buildings. Owing to the need of suitable ground and the lack of the necessary railroad facilities, the firm are driven to the necessity of looking for a place elsewhere to locate part of their works. All the ground available in the neighborhood of the present works has been utilized at great expense. At one time the firm straightened out a large bend or curve in the Schuylkill, the Navigation Company's towpath being moved out into the river, and the rocks and other obstructions cleared away in order to make a new channel for the canal boats. The Old River road was vacated, and the company in order to use it built a new road along the hillside above the railroad. A new 7-foot gauge railroad is being built for an improved locomotive-crane to connect the different buildings of the plant.

About 3,000,000 acres of land in Minnesota recently acquired from the Indians will soon be opened to settlement.

The Paris Exposition.

(*Editorial Correspondence.*)

At the corner of the side aisle and one of the main cross passages in Machinery Hall a commodious space is reserved for the American Pneumatic Tool Company. At the time of the visit of your correspondent, as late as the third week in July, the exhibit was not in working order, so that the apparatus was shown to the jury in an adjoining space. One source of complaint which your correspondent heard among those who are located along the side of the Machinery Hall was that the shafting provided was utterly inadequate and weak. It is poorly put up and has given much trouble to those who have been forced to depend upon it. This, of course, does not apply to those who are located along the center lines of the hall, where the arrangements are far more satisfactory. Adjoining the space of the Pneumatic Tool Company is that of J. H. Sternbergh, of Reading, Pa., the well-known bolt manufacturer, who shows a new bolt-machine in operation, and has also a neat case of Perfection, Acme and Ideal screw-drivers, which were described in *The Iron Age* when they were first put on the market. The Cyclone pulverizer, in which Erastus Wiman is largely interested, attracts some attention Near it Lewis M. Chapman does glass-spinning and seems to drive considerable of a trade in placing cheap knick-knacks with the gazing multitude. In their order come the Casey Machine and Supply Company, of New York, with a machine for double-embossing for book-binders, a double job press using two colored inks, feeding and printing from a roll, and a box-nailing machine capable of driving 800 nails per minute. By their side is the Paine Shoe Lasting Machine Company, followed by an exhibit of J. Thomson, of Temple Court, New York, of embossing and printing presses containing a number of admirable features and neatly-developed mechanical points, which it would be impossible to describe without elaborate drawings. This machinery is manufactured at Colt's Armory. Mr. Thomson shows also his ingeniously-contrived water-meters, developed during the past few years and gaining rapidly in favor. A series of presses—the Golding, Liberty and Campbell—carry us to the boundary of the American section, where, too, the Thorne composing-machine is located. Returning along the center aisle the first, most conspicuous and by far the finest single American exhibit in Machinery Hall is that of J. A. Fay & Co., the well-known manufacturers of wood-working machinery, of Cincinnati, Ohio. Among them your correspondent noticed a large automatic double tenoner for car sills and general heavy work, a smaller No. 3 door and sash tenoning-machine with its vibrating carriage, running on a single slide and a V connection uniting at the base to a swinging crank; a No. 2 mortising and boring machine with auger in center of chisel, a saw capable of being placed at any angle for angles and miters, used in pattern shops; a bevel saw for squaring and mitering, a traversing saw with miter arrangement, a four-spindle horizontal boring-machine, a reciprocating jig-saw for inside work, an universal wood-worker, a straight and concave automatic grinding-machine, band-saws, dove-tailers, &c. W. H. Doane, of Cincinnati, who has charge of the exhibit, speaks well of the interest it is attracting. Your correspondent, who spent some time in examining it, saw many evidences of it, aside from the curiosity shown by the usual gaping throng, whose ignorance is such a tax upon the patience of those in attendance. Near the Fay exhibit is that of the American Screw Company, who have their now famous screw-rolling machinery in operation. Both their methods and the product the readers of *The Iron Age* are thoroughly familiar with. Your correspondent was impressed with the statement that it is through the cheapening of basic steel with its remarkable qualities that the new process of manufacture has become a commercial success. The leading principle which is followed throughout the work is that any effort to force the metal to assume the shape intended is found to result in failure. It must be carefully coaxed by causing it to flow naturally. The speed of manufacture is about 60 screws a minute, while the ordinary methods of cutting produce the article at the rate of about 70 screws in the same time. We need not enlarge on the claims of the American Screw Company in regard to the production of a screw from four to six sizes greater than that made of the same size of rod by cutting, or the cheapening of cost due to reduced waste. We may quote the following, however, from the circular issued at the Paris Exposition by the company: "The process will be worked in America by them exclusively, and changes in their extensive plant are now being made to meet the demand, their present product by this process being greatly preferred to that of cut screws by all large consumers. The foreign patents will either be sold or worked in connection with others or on their own account, as circumstances may dictate."

The E. W. Bliss Company, of Brooklyn, occupy a large space, in which they show in operation a No. 5 direct-acting forge-drop, which was illustrated and described in *The Iron Age* of February 28, 1889; a No. 1½ toggle drawing press whose features were dwelt upon in *The Iron Age* of June 23, 1888. In addition to these they present their No. 18, No. 19 and No. 21 presses. They are adjustable, so as to be set on an incline, to allow work thrown out by the die to fall off by gravity. The usual features of this class of machines are present in their most important form, including adjustable gibs, with V-shaped bearings for the slide, an adjustable connection to the slide, with right and left hand thread and check nuts; a positive knock-out attachment to throw the work out of the punch or upper die when it sticks there, and an entirely new clutching device for locking the wheel to the shaft. This last is a very important improvement, being at once simple yet very powerful, and leaving a solid bearing in both wheel and shaft. Nos. 18 and 19 presses are used very largely in the manufacture of all kinds of tin cans for fruits, vegetables and dry substances; also in the manufacture of electrical fittings and brass, iron and steel goods in great variety. No. 21 press is used in making larger and heavier articles of iron, steel, brass, tin, &c., than can be made in Nos. 18 and 19 presses, by the use of dies adapted for each particular kind of work.

The Ingersoll-Sargent Rock Drill Company have an exhibit including an air-compresser, a channeling-machine, a rock-drill and a coal-drill. The Simonds Rolling Machine Company, whose work is thoroughly well known to the readers of *The Iron Age*, occupy an adjoining space. The machinery on this side of the main aisle is driven by an automatic cut-off engine built by C. H. Brown & Co., of Fitchburg, Mass. The other side is provided with power by a Straight-Line engine, with the steel belt made by Emerson & Midgeley, of Beaver Falls, Pa. A great deal of space in this section is taken by electrical exhibits, among which that of Edison is not very favorably conspicuous. Among the other exhibits we note that of the American Tool and Machine Company, of Boston, and Warner & Swasey, of Cleveland, with a very handsome line of brass-working machinery and the splendid electric welding of Elihu Thomson.

The Stiles & Parker Press Company, of Middletown, Conn., have among their machinery a No. 3 Stiles press, the features of which are widely known; one No. 11 open-back press for blank-cutting, perforating, &c., with the new device for adjusting the pitman and the circular shoe to take up the wear, and one No. 14 central-swing press, which can be adjustably inclined so that the operator can place himself at ease. They show also a No. 74 straight-sided power press, with the well-known Webster wedge adjustment; one of the new No. 204½ double-action toggle-joint drawing-press triple geared and with friction clutch, so that the motion can be stopped, held and started at any point of the stroke. A No. 3 Stiles watch-press has the neat Stiles graduated adjustment, which, coupled with the eccentric adjustment, allows of a wide range of stroke. It is provided, too, with the positive stop, a device which prevents a second stroke even if the foot of the operator should not be removed from the treadle. In addition to these presses, the Stiles & Parker Press Company exhibit their brass founders' power sprue-cutter, set on an incline so that the work will fall off readily after being cut, and with the cutters so arranged that they can be easily removed for sharpening, and they have placed also on exhibition one of their No. 297 foot-lever sprue-cutters, with their special appliance for simple changing after adjusting the cutters. Finally, they have at work a 200-pound drop-hammer for forging, equipped with their lifter and their arrangement for adjusting the stroke.

In an upper gallery of Machinery Hall are located a number of sewing-machines, among which your correspondent observed the Becker door-closer and noiseless mechanical check, which has been on the American market for some time and is now being introduced in Europe. Near it is the system of fire-proof construction designed by George Hayes, of New York. A number of American exhibits are in actual daily use as part of the machinery of the exhibition. Prominent among them we may note the Babcock & Wilcox boilers and the Worthington pumps.

AMERICAN EXHIBITORS IN THE PALACE OF INDUSTRIAL ARTS.

The second large aggregation of American manufactures is in the Palace of Industrial Arts.

Squarely in front of the American section is a model statue of Lafayette, by C. E. Dallin, presented by Dr. Thomas W. Evans, of Paris, to that city, and recently unveiled. On both sides of the court are a series of handsome specimens of petrified wood from Arizona, exhibited by the Drake Company, of St. Paul, Minn., and Sioux Falls, D. T., who have also a very elaborate collection of the crude material and a number of articles made of it in another part of the section. Entering the United States section we find on the one hand the joint exhibit of the Western Electric Company, of Chicago, and the American Bell Telephone Company, of Boston, and opposite them a collection of electrical apparatus designed by Elihu Thomson for use in his researches. Your correspondent cannot claim to be an expert in this field of science. He learned, however, that at a special meeting of the Société de Physique the scientists there gathered listened with rapt attention to a description of the apparatus exhibited, the paper being followed by a storm of applause, and leaving the gathering in a very excited and laudatory frame of mind. Taintor's graphophone and Edison's phonograph are naturally great at-

tractions, and on the whole are shown in very much better style than the electrical exhibit in the Machinery Hall. The Electrical Supply Company, of Ansonia, Conn., have a case of Elisha Gray's original apparatus for telephonic transmission. Among them was noted a 20-octave musical transmitter dating back to June, 1874; an organ-pipe transmitter, a 2-stop receiver, a violin receiver, tambourine and revolving-drum receivers, all dating back to 1874. Back of it the Consolidated Telegraph and Electric Subway Company, of New York, have specimens of conduits, photographs and elaborate drawings. In a corner of the section the American Institute of Electrical Engineers have their rooms, near it being a collection of insulated wires and cables by the Okonite Company, of New York. A few specimens are shown of McIntire's electric wire connections, made in Newark, some coils of hard-drawn copper wire by the Bridgeport Brass Company, wooden conduits by the American Indurated Fibre Company, of Mechanicsville, N. Y., and an exhibit by the Cobb Vulcanite Wire Company, of Wilmington. Then follow the Remington and World type-writer companies. W. R. Warner & Co., chemists, of Philadelphia, show a very large case of chemicals, back of which the famous Harney Peak Tin Mining, Milling and Mfg. Company display specimens of Dakota tin-stone, which has grown so familiar to the metal trade in the past few years. Near it is an exhibit of the Unique nutmeg-grater. Brewington, Bainbridge & Co., of Baltimore, show a number of their Egyptian tin-ware, including cans, dust-pans, cups, coffee-boilers, kettles and pans in a number of different colors. Their agents, Samuel Lees & Co., exhibit also the Acme lemon-squeezer, Keystone clothes-wringer, Samson cork-puller, manufactured by the F. F. Adams Company, of Erie, and the Florence oil stove. The Sphingter Grip Armored Hose Company, of 9 Murray street, New York, are represented by their specialties, while the Revere Rubber Company show the Giant armor-protected hose. The latter exhibit also seamless belting, mats, and, among others, show a sample of Granite belting made for the Pennsylvania Railroad elevator, which was 850 feet long and weighs 6315 pounds. The State of Nevada has attempted to impress Europe with a mineral collection in the form of a lot of small specimens gathered in one case, which are hardly likely to redeem that declining State. The Richmond Cedar Works, of Richmond, Va., who have the distinction of having originated in the famous Libby Prison, come to the front with a very creditable show of pails and tubs. Near them Abraham Bros. & Co., of Cleveland, Ohio, have a small but neat collection of metallic brushes, while the well-known Stanley Rule and Level Company, of New Britain, have filled a neat case with their attractive specialties.

This brings us to the center of the American exhibit, where two aisles crossing have given special opportunities for a very attractive display. Tiffany & Co. occupy one of the corners, and it is needless to add that they have made the best of their opportunities and have contrived to render that part of the American exhibition one of the gems of the whole palace. The other corners are occupied by really brilliant collections by the Meriden Brittania Company, of Meriden, Conn., and the Gorham Mfg. Company, of Providence, R. I., who show the famous Century vase, while the fourth corner is taken by a joint exhibit of the Rockwood Pottery Company, of Cincinnati, and Davis, Collamore & Co., of New York. The center of the two crossing passages is occupied by a round case filled with American gems collected by George F. Kunz, of Tiffany & Co. Altogether it is a very gratifying thing to Americans who look forward to a rapid development of artistic work in their own country to wander from one to the other of these four great exhibits, covering as they do a wide range of work and showing an originality and taste which promises well for the future.

Wandering onward, we reach the exhibit back of the partition inclosing the space of the Meriden Britannia Company and of the Union Metallic Cartridge Company, of Bridgeport, whose goods are attractively displayed. John J. Knowd, of Philadelphia, is the manufacturer of hand-made steel shoes for trotting-horses, hunting-shoes and racing-plates. The rest of the partition is covered with a series of specimens of California red-wood, handsomely grouped by F. Korbel & Bros., of San Francisco. Along the wall the Bissell Carpet Sweeper Company, of Grand Rapids, Mich., and the Castle Sweeper Company, of Geneva, Ohio, show their specialties, which, so far as we have been able to learn, are very little known in Europe. The Ausable Horseshoe Nail Company have traced their name in one of the cases placed in this part of the section. Fairchild pens front on the aisle, while in the vicinity the Winchester Repeating Arms Company, of New Haven, have an exceedingly attractive series of guns, muskets and carbines, and show also cartridges and Hotchkiss shells. Then follows the court of the United States, including an exhibit of the instruments used in the time service of the United States Naval Observatory and a handsome collective mineral exhibit. The court itself is attractively ornamented by the famous photographs on glass which the United States Geological Survey has gathered in a course of years in its explorations of Rocky Mountain cañons and mountains. In the immediate vicinity the Yale & Towne Mfg. Company have established a post-office in accordance with the system so thoroughly well-known to Americans and so well worthy of imitation abroad. The same company in adjoining cases show locks and builders' furniture, the Bower-Barffed articles being particularly striking. P. & F. Corbin are represented by a handsome series of their specialties, and the Corbin Cabinet Lock Company, of New Britain, Conn., show tasteful locks and house furniture, post-office delivery boxes and builders' hardware. The Plant system of railroad has transferred to Paris its collection of the native wood and products along its line, which attracted so much attention at the New Orleans Exhibition.

Passing by a number of other exhibits of less interest to our readers, we may note quite an attractive collection by the Rochester Lamp Compnny, of Rochester, N. Y. This brings us to the end of the American court, which is notable for a huge statue of chocolate, which has already suffered from tasting, a beautiful case of arms by the Colt's Patent Fire Arms Mfg. Company, of Hartford, a pyramid of Waterbury watches and a striking case of Smith & Wesson revolvers.

Turning backward and glancing along the articles gathered on the other side of the aisle, we observe indurated fiberware by Cordley & Hayes, who represent the Western Indurated Fibre Company, of Winona, Minn.; the United Indurated Fibre Company, of Lockport; the Watertown Indurated Fibre Company, of Watertown, Mass., and the United Indurated Fibre Company, of Portland, Me. The Frederick Crane Chemical Company, of Short Hills, N. J., have a large number of samples of their zapon and brassoline, showing a number of objects protected by zapon enamel. Near them is an exhibit of Hartshorn self-acting rollers and the Nutrizio copper pot. The Enterprise Mfg. Company live up to their name by bringing forward a large collection of their well-known specialties, including Mrs. Pott's sad-irons, lawn-mowers, coffee, drug and spice mills, self-measuring faucets, sausage and meat choppers, beef-shavers, fruit and jelly presses. In a corner near them what was formerly the Hartman Mfg. Company, of Beaver Falls, have a few mats, wire, wooden mats, fencing, &c. A neat case by the Howard Strop Company, of Charleston, Mass., contains their specialties. Then follows a very showy and altogether attractive collection of minerals and birds, &c., by E. A. Foote, of Philadelphia.

In one group together, apparently represented by H. Montanari, of Paris, are coopers', carpenters', ship, butchers' and ice tools of L. & I. J. Wood, of Buffalo; the Barler sifter, of Sidney Shepard & Co., Buffalo; the bit-braces of the American Bit Brace Company, of Buffalo; the meat-choppers and stuffing-machines of Jonn E. Smith & Sons, of Buffalo; the automatic cartridge-loader of Bailey, Farrel & Co., Pittsburgh; automatic twine-holder, by the International Speciality Company, of Buffalo; the Enterprise feed-grinder, by the Enterprise Mfg. Company, Columbus, Ind., and steel portable ovens, made by A. Reid, of Buffalo. The Standard Target Company, of Cleveland, show their traps, trap pullers and cartridges, while the Miller Lock Company, of Philadelphia, have an exhibit of Champion padlocks and deed and cash boxes. Among the other exhibits of this section we noted also axes and picks by A. G. Peck & Co., of Cohoes. Then follow a number of type-writers, among them the Mercury, the Barlock and Columbia, graphostyle, &c., an exhibit by the Commercial Cable Company, and finally the showy rooms of Edison's phonograph.

Coil Boilers for Ships.—The Naval Board appointed to test coil boilers have received notice from Mr. Cowles, of New York, and Mr. Ward, of Charleston, W. Va., that they will be prapared to submit specimen boilers for testing within the time specified—three months from the date of notice. The engineer officers of the navy are much interested in these tests. If the results should be favorable the boilers will be adopted for the new coast-defense vessels now building at San Francisco. Small boilers of the tubular character have been used successfully on small boats, and if they fulfill the requirements of war-ships in the matters of economy of space and weight it will be possible to largely increase the steam-power and consequently the speed of our naval vessels. The Cowles boiler is said to resemble the famous English Thorneycroft torpedo-boat boiler, while the Ward boiler, of a different type, has been used with good results in our naval launches.

At the trial trip of the U. S. cruiser Charleston, in San Francisco Bay, a speed of over 19 knots was attained and more than the maximum horse-power was developed, but after a run of two and a half hours the eccentric of the air-pump of the forward engine slipped, interrupting the trial.

The factory inspectors in New York and Brooklyn have completed their work and will report to the Legislature. They find a good deal of improvement in the general condition of many factories as to the sanitary arrangements, precautions for escape in case of fire, and arrangements to protect girls from the advances of the male employees. But nevertheless there is a great deal still to be desired.

An iron mill in Rome, Ga., is turning out ten tons of cotton-ties a day, and, by working night and day, can supply ties for one-sixth of the whole cotton crop.

THE WEEK.

It is announced that the Vanderbilts will extend the Beach Creek Railroad to Oil City, where connection can be established with the Lake Shore and Michigan Southern Railroad, thus opening a route to Chicago about 150 miles shorter than the Reading and the New York Central and enlarging its traffic in coke, coal and iron.

It is rumored that the Inman Steamship Company are in doubt about accepting the City of New York from her builder. Unlike the City of Paris, something is the matter with her always at a critical period, making it necessary to apologize for her performances. The City of Paris, on the contrary, arrives on time, keeping all her engagements.

President Howell, of the East River Bridge, believes that a double system of train service can be introduced, permitting cars from the elevated railroads from either city to be switched on that structure, by laying ties and rails on what are known as the top chords of the present bridge railway. The estimated cost is $500,000.

The American export trade in manufactured cotton has received a decided check this year, the total shipments since January 1, having amounted only to about 100,000 packages, valued at $6,690,000, which is below the aggregate of any corresponding period since 1881. The falling off has been a regular decline since 1886, when the exports for eight months were $2,000,000 larger than for the same time in 1889. The Chinese market is not so good.

It is figured up that the Alaska Commercial Company during the 20 years of their contract will have derived from the seal fishing a net profit per annum of $2,500,000 to set against the annual revenue of $170,500 derived from that source by the United States.

The Spreckels sugar refinery in Philadelphia will be in operation about October 1 and turn out 1000 tons, or about 7000 barrels, a day. The machine shops are almost finished.

The new Government dry-dock at Norfolk is nearly finished. The gate that closes the dock is a remarkably fine piece of work, and one of the pumps has a capacity of 47,000 gallons per minute.

A German company with $5,000,000 has been formed to complete the Simplon tunnel. Italy will provide $3,000,000 as an equivalent for the possession of one end of it.

A Seattle correspondent says: "Puget Sound cities have sites which to the stranger look very much alike. They are on hills which rise from the water's edge and which at some not remote period were covered with enormous pine trees. The remains of the giants of the forest are plenfiful beyond the edge of settlement. But similar as the locations seem, one readily learns the very material and exclusive advantages of each. Olympia, the capital, had 50 years the start of Seattle, and Tacoma was pushed into prominence by the powerful backing of the Northern Pacific, which made that city the sound terminus. Yet Seattle is ten times as large as Olympia and asks no odds of Tacoma, even with the temporary set-back of the fire. First and foremost of the advantages which Seattle claims is her harbor. In waters where the average tide is 17 feet and where the change may be as much as 22 feet 6 inches, it is a good deal to have a depth just beyond the shore line sufficient to load ocean ships to their fullest capacity without regard to tide. This Seattle has. Her piers extend out from the shore only a sufficient distance to give good warehouse space, and she is independent of all tide changes. Seattle has 50 steamboats running in various trades and furnishes two-fifths of the coal supply of San Francisco."

The commerce of the Lake Superior region continues to grow. In July last the Sault Ste. Marie canal, which forms the gate-way, locked through 1606 vessels of all descriptions, including 1067 steamers. This is the heaviest business of any month in the history of the canal. The total registered tonnage amounted to 1,163,502 and the freight tonnage was 1,251,000. Upward of 672,000 tons of freight passed through in a single day.

A tunnel under the Harlem River, to cost $2,000,000, is recommended by a commission of the Park Board as a means of transit, rather than a draw-bridge, as a substitute for the McComb's dam bridge.

The building of the St. Louis Elevated Railroad is now assured. Among the capitalists who will furnish the $7,000,000 to construct the road are Albert Stattheimer, Ernest Thalman and Edward Lauterbach, of New York, and Adolphus Bouzano, of Philadelphia.

James McMillan, the resident director of the Cambria Iron Works, says that in five years Johnstown will be built up better than ever before.

Spreckels' new wharf at San Diego, Cal., with its coal-bunkers of 15,000 tons capacity and 108 coal-chutes, is claimed to be the largest on the Pacific Coast.

John W. Mackay, Jr., son of the bonanza king, is having a naphtha steam yacht constructed larger than any now afloat.

The total valuation of Worcester, Mass., is $68,000,000, an increase of $4,896,000 over the previous year.

The Palmer Ship Building Company have just launched for London owners a tank steamship specially designed for the Philadelphia petroleum trade. It will be divided into eight compartments and will be able to carry both crude and refined oil at the same time. The tanks can be taken out, if necessary, and general merchandise substituted.

General Duane, president of the Aqueduct Commission, says the water supply of New York City will be ample after next June. Then the new aqueduct will begin to bring some 135,000,000 gallons of water daily from Sodom Dam and the Croton River, as against the 112,000,000 gallons now secured from the Croton and Bronx rivers.

Six dynamite guns are now being constructed by the New Jersey Steel and Iron Company, of Trenton, N. J. The guns are to be 50 feet long, 11 inches in diameter, and will be made in three sections. The guns are to be completed by January 1 next.

Jacksonville has been selected as the shipping port for Florida cotton, rather than Savannah, and the first bale was shipped to New York by the Clyde Line, free of charge.

The late Mr. Thaw, of Pittsburgh, is said to have had $1,000,000 invested in the Inman Steamship Line. A goodly amount of American capital is represented by steamship property under the British flag.

Four of the large Staffordshire potteries in England have signified their intention of removing to New Jersey, with their molds and potteries.

The iron tank steamer Eliza Maria sailed from Point Breeze, near Philadelphia, last week, with 1,500,000 gallons of refined petroleum, and another tank steamer of 1,000,000 gallons capacity is now loading, both destined to Hamburg. One tank steamer will carry about three times as much oil as the average sailing vessel, and can make the journey to the Continent in about half the time.

The revolution in Hayti has culminated in the retirement of Legitime from the contest and the occupation of Port au Prince by Hyppolite, commanding the northern forces These events took place on Friday and Saturday last. Legitime withdrew on board of a French corvette, where he naturally finds his warmest sympathizers, while Hyppolite is supposed to have many friends among the mercantile classes in the United States, from whom, it is said, he has received much substantial aid. Trade is expected to receive a new impulse.

The Boston Towboat Company, who were among the foremost to undertake the transportation of coal in barges by the outside route, are about to increase their capital to $1,000,000.

In numerous instances propellers made from manganese bronze have been adopted by the fast ocean steamships, and where a change has been made from steel blades it is claimed that the speed was increased almost a knot an hour. Eight ships of the White Star Line have propellers of manganese bronze, as well as the City of New York and the City of Paris and two of the Cunarders. A peculiar kind of manganese bronze is used for this purpose, which possesses great strength and toughness, said to be about equal to that of the best cast-steel, besides being smoother and less liable to warp.

George O. Vanderbilt, Johnathan H. Blackwell, John H. Scudder, Ferdinand Roebling, Chas. Roebling, P. M. Terlane, Chas. B. Moore, W. D. Aiken, G. W. Devoe, H. Niemeger and others have been investigating a proposition to build a furnace at East Birmingham, Ala. A report has been made by C. A. Meissner, formerly of Joliet, Briar Hill and Sterlington, in which that gentleman makes the following estimate of cost, assuming the furnace to be 65 x 14 feet :

Comparative Cost North and South.

Cost of Pig-Iron per ton in Alabama.	
2 tons of ore at $1.25	$2.50
1½ tons of coke at $2.25	3.40
1 ton lime at 65 cents	.65
Labor	1.60
Incidentals	.25
Interest 4 per cent. on total capital	.20
Repairs	.50
Total	$9.10
Freight to New York	3.90
Total	$13.00
Selling price at New York	16.00
Profit per ton	3.00

80 tons per day for 300 days, 24,000 tons per annum, or $72,000 profits at $3 per ton.

Average Cost Pig-Iron per ton in Ohio and New York.	
Ore	$7.50
Fuel	5.00
Lime	.80
Labor	1.75
Incidentals	.25
Interest	.20
Repairs	.50
Total	$14.00
Average freight to New York	1.00
Total	$15.00
Selling price at New York	16.00
Profit per ton	1.00

This is an average cost taken from direct personal experience.

Mr. Meissner estimates that the furnace can be built for $100,000 to $125,000, so that a company having a capital of $150,000 would have sufficient working capital.

Potts Brothers Iron Company and the Glasgow Iron Company, of Pottstown, Pa., have increased the wages of their puddlers from $3.20 to $3.50 per ton and their other employees have been given a corresponding advance.

MANUFACTURING.

Iron and Steel.

The strike at the furnace plant of the Carrie Furnace Company, at Rankin station, near Pittsburgh, has been settled to the entire satisfaction of all concerned. Furnace No. 1 is in blast again and No. 2 will be blown in during the present week.

The Glasgow Iron Company of Pottstown, Pa., have given notice of an increase of wages in the puddling department of their works. The advance is from $3.25 to $3.50 for boiling and a proportionate advance to other men employed about the puddle-mill. The advance went into effect on Monday, the 26th inst.

It is reported on good authority that the plant of the Keystone Furnace Company, at Reading, Pa., who made an assignment last week, will now pass into the control of the Reading Iron Company, at Reading, Pa., who have been formed out of the Reading Iron Works

Emaus Furnace, at Emaus, Pa., formerly operated under lease by the Donaldson Iron Company, was leased recently to Pancoast & Rogers, of New York City. Preparations are now being made to put the furnace in blast.

Carnegie Bros. & Co., Limited, of Pittsburgh, have commenced the erection of two additional blast-furnaces, at Braddock, Pa., which will be known as Furnaces H and I. The furnaces will be 80 feet in hight and 20 feet in diameter at the bosh, and will have a capacity of about 250 tons per day each. Work is being prosecuted vigorously, and it is expected that Furnace H will be ready for blast by April of next year. The completion of these two stacks will give the above firm a total of nine stacks at Braddock. Furnace F has been blown out and is now being relined and otherwise repaired. When it is blown in again, Furnace G will be blown out for relining and repairs.

The nail works of the Bellefonte Iron and Nail Company, Limited, at Bellefonte, Pa., which have been idle since last June, were started up during the present week. During the shut-down various improvements have been made to lessen the cost of production.

A new puddling department is being erected by the rolling-mill department of the National Tube Works Company, of McKeesport, Pa. It will be known as Puddle No. 5, and contains 12 double puddling furnaces, engine, squeezers, hammer and all other equipments belonging to such a department. The new mill will be ready for operation about September 10 next, and will give employment to about 100 men.

A press dispatch from Greenbrier, W. Va., under date of 23d inst., says: "The Glenmore Iron Company, recently organized, and the plant for whom is about completed, will begin operations Monday next. The company have strong backing from Eastern capitalists. It has been developed that the Greenbrier County iron ore is first class."

The Duquesne Tube Works Company, of Duquesne, Pa., report that their works are in steady operation with an excellent demand. The report that this firm were about to increase the wages of their workmen is without foundation.

In *The Iron Age* of August 15 we reported the total product of Furnace F of the Edgar Thomson Steel Works. The *Bulletin* of the American Iron and Steel Association prints the following additional details: "This furnace was blown in on October 18, 1886, and was banked up twice on account of strikes for a total period of 73 days. The time that the furnace was in blast, exclusive of strikes, was two years, seven months and eight days. The record of the blast is as follows:

Total product	224,795	gross tons.
Daily average	237	" "
Best day's output	419	" "
Best week's output	2,161	" "
Best month's output	8,478	" "
Coke per ton of iron	2,317	pounds.

Length of blast, total product and daily average product taken together make this the best blast-furnace record of which the country can boast. The best day's output, best week's output and best month's output have also never been excelled. We congratulate Superintendent Gayley upon his splendid achievement. Isabella Furnace, No. 2, now running, has had a longer blast than Furnace F and promises to attain a larger total output before it is blown out, but its daily average will be less. Mr. E. C. Potter, at Chicago, has obtained better fuel results per ton of pig-iron than Mr. Gayley shows for Furnace F. Taken all in all, however, the record of Furnace F above given is, as already stated, the best. It is wonderful."

We are informed that the report that Dilworth, Porter & Co., of Pittsburgh, have decided to commence the erection of a number of puddling furnaces for the purpose of making their own muck-iron is without foundation. Such a step is not in contemplation at present.

The Monongahela Furnace Company, of McKeesport, Pa., have awarded the contract for the grading and excavation, the foundations and masonry-work, and timber and pile trestles for their proposed two new blast-furnaces to Stark Bros., of Greensburg, Pa. Work was commenced on the contracts on Monday, the 29th inst.

The work of putting in the third converter at the Lackawanna Iron and Coal Company's Works, Scranton, Pa., is progressing well. It is not probable that the new blooming train will be ready before about two months. This train is to serve as a relay in case of a break-down of the old one, which is now doing all the work. It will also be used to roll standard 4-inch billets for rod mills.

A movement is on foot to revive the Carp River charcoal furnace, near Marquette. Thirty thousand dollars of local subscriptions are asked for. The corporation will be capitalized at $150,000, toward which Burt Bros. will contribute their quarry and mineral properties, valued at $100,000, and $20,000 cash.

The Crane Iron Company, of Catasauqua, are experimenting with the Bookwalter process, having put up one converter.

Jerome L. Boyer and P. R. Stetson have been appointed appraisers of the property of the Keystone Furnace Company, Reading, Pa., who have made an assignment. Besides the $175,000 mortgage held by the Reading Trust Company there is a floating debt of from $40,000 to $50,000. The Philadelphia and Reading Company own the bonds of $175,000 under the mortgage. The furnaces are now in the hands of the assignee and there is stock on hand to keep them running for three weeks. The directors of the Keystone Furnace Company are Henry Bushong, Geo. B. Connard, David P. Schlott, Charles A. Bushong and John F. Bressler. Mr. Bushong has been the president, Mr. Connard took the place of Herbert Bushong as secretary and treasurer, and Mr. Bressler has been the foreman of the furnaces for years. Jacob and Henry Bushong are the principal stockholders, only a few shares being held by others.

Machinery.

The Walker Mfg. Company, of Cleveland, Ohio, report business very good at present, with orders considerably ahead. They have recently been awarded contracts for cable-driving machinery for the Washington and Georgetown Railway, Washington, D. C., and also for the People's Railway Company, of St. Louis, Mo. They have also in hand a 10-ton rope-drive power traveling crane for the Iron Bay Company, of Duluth, Minn., and considerable other general work, which is crowding the establishment. Among other improvements recently made by them, and which places them in excellent shape for the production of heavy work, is a very large pit lathe, capable of turning work up to 30 feet in diameter by 8 feet 6 inches face. This lathe is a combination tool, it being not only a pit lathe, but also a huge planer, in which surfaces 30 feet long by 8 feet 6 inches wide can be planed. It also has facing attachments for the proper facing up of columns and girders. In addition, there is a gear planer attachment, whereby the teeth can be planed in gears of any size up to 30 feet in diameter and of any proportions desired.

E. D. Goodwin, manager of Chicago branch of Lodge, Davis & Co., informs us that they have found their present quarters at Lake and Canal streets entirely too small to carry the necessary stock of machine tools. They have therefore secured the double stores, Nos. 68 and 70 South Canal street, near Madison, which will give them 7000 feet of floor-space.

On September 3 to 5 there will be a public exhibition of a new hydraulic engine at the Isabella Furnace, Barneston, Pa. In the invitation we have received it is stated that, "this engine is of an entirely new type, adapted to all cases where water-power is to be used for pumping, or for compressing air, or for transmitting power to a distance."

Contracts have been signed by the Pusey & Jones Company for the construction of two steel hull stern paddle-wheel steamboats for the Jacksonville, Tampa and Key West Railroad Company, to ply on Indian River. The largest will be 130 feet long and draw only 18 inches of water.

The capitol building at Austin, Texas, will be provided by the Pond Engineering Company with a 70 horse-power Armington & Sims engine and a 70 horse-power boiler for running the electric-light plant.

The boiler shops of the Bigelow Company, at New Haven, were totally destroyed by fire on the 23d inst. The engine and rivet shops also caught fire, but the firemen after several hours' work saved the main portions of the buildings. Loss about $75,000; partly insured.

It is reported that the demand for the Westinghouse automatic compound engine is such that engines are contracted for before their building has been even commenced. Until recently only seven sizes were built, from 25 to 150 horse power. It was found necessary to add two more sizes of 200 and 250 horse-power, and every effort is being made to finish them, as twelve of the former and several of the latter have already been sold.

The new pipe foundry of the West Superior Iron and Steel Company, West Superior, Mich., is rapidly nearing completion. The Dickson Mfg. Company, of Scranton, Pa., are well advanced on the seven cranes which will be required at the start. The tools are now being placed in the machine-shops. The patterns are running on flasks and fixtures, and a force of molders will soon be at work on the cast-iron work of the pits, &c. Excellent

loam and sand have been found close to the foundry, and all in all the prospects are regarded as very favorable.

W. E. Case and A. F. Ward, formerly of Toledo, Ohio, where they were until recently engaged in the production of specialties in brass, have removed to Newcomerstown, Ohio, where they have secured new premises and fitted them out with the latest and most approved machinery for the purpose of carrying on the business of general machinists and founders. The title of the new company will be the Oxford Machine Works. The company will at an early date bring out several new specialties in iron and brass, for which patents are pending, and are at present actively engaged in the erection of a foundry building.

The Duff Company Steam Forge Works, at Troy, Ohio, have decided to accept a new location at West Superior, Wis. To obtain this new accession several business men offered the works a tract of land valued at $15,000, with a cash bonus of $5000 in addition. The machinery of the plant will be removed as soon as details of the transportation can be completed. The building which will accommodate the concern will be 150 feet in length and 70 feet in width. Two trip hammers will be put in, one with 16-inch face and another of 8 inches. The company look forward with confidence to a good business in marine-boiler construction, and all wrought-iron products. In the manufacturing of shafting, too, the plant will produce as high as 20-inch, which will meet the demand anywhere.

Hardware.

The Manhattan Silver Plate Company have removed from Brooklyn, N. Y., to Lyons, N. Y., and are occupying the old furnace building on Broad street. This building is 70 x 70 feet and of three stories. Besides this main building there are now on the lot a machine shop 30 x 40 feet, boiler-room 20 x 30 feet, casting-room 15 x 30 feet and other buildings suitable for storage. The company have made a large outlay for alterations and improvements, and their factory is now regarded as well arranged and equipped. A new 75 horse-power engine has been put in. This increase in their facilities, it is expected, will put them in a position to take care promptly of their increasing business.

Kentucky Wagon Mfg. Company, Louisville, Ky., are now well settled and in active operation in their new works. The main building is 786 feet long and 120 feet wide, covered by 2¼ acres of roof. The storage warehouse for finished wagons and shipping-room is 440 feet long, 120 feet wide, two stories, and contains over 2½ acres of floor space.

The Stover Bicycle Company, of Freeport, Ill., have recently organized under the State laws, with a capital stock of $100,000, for the manufacture of high-grade safety bicycles. The necessary machinery, stock, &c., have been purchased and the first lot of 25 machines will be completed about September 1. The company is composed of leading business men and capitalists of that city, among them being a number of inventors of note. The company is made up of D. C. Stover as president; F. Bartlett, vice-president; M. Hettinger, treasurer; W. A. Merrifield, secretary; Wm. C. Smith, superintendent; C. O. Collman, auditor, who are also directors, together with C. Nieman, M. Hettinger, Jr., A. S. Held, O. J. Ziegler, W. A. Hance. The superintendent, Wm. C. Smith, acquired a thorough knowledge of bicycle-making in England, first employed by Singer Mfg. Company and subsequently by Coventry Machinists' Company as foreman and later by the Gormully & Jeffery Mfg. Company, Chicago, where he held the position of foreman five years, and is referred to as thoroughly posted in all the details of making wheels and special tools and machinery pertaining thereto. The company start out under most auspicious circumstances. Patents are now pending for valuable improvements in bicycles, which improvements will be incorporated in the first lot of wheels.

The new shovel works of Hubbard & Co., at Pittsburgh, were put in operation last week, giving employment to about 300 men. The firm expect to turn out 100 dozen of shovels per day, and will increase this number in a short time.

Miscellaneous.

The American Copper Coke Company, recently organized at Pittsburgh, have concluded arrangements for the establishment of a branch works at Birmingham, Ala. The company are erecting a plant of 60 coke-ovens at that place and also a 350-ton coal washery. The entire plant will cost $125,000.

In our description of the electro-automatic railway for mails and packages, presented last week, the types made us say that a speed of "over two miles an hour has been attained." The fact that "hour" should have been minute is so apparent that there is little danger that the statement misled our readers.

The National Pulley Covering Company, of Baltimore, Md., are furnishing a great many of their covers for quarter-twist belts, which, as is well known, are a source of much annoyance owing to their tendency to come off the pulley. The covering does away with this trouble. A recent order has been received from Alfred Dolge, the large felt manufacturer, of Dolgeville, N. Y., for his main driving pulley, which has a 40-inch face, is 5 feet in diameter, and transmits 150 horse-power.

Proposals will be received until September 18 by J. C. Mallery, Captain of Engineers, U. S. A., Baltimore, Md., for furnishing the materials and labor of all kinds necessary for the completion and delivery of the metal-work of the Gull Shoal and Pamlico light-houses, North Carolina.

Notes on the Manufacture of Open-Hearth Bridge Steel.*

BY N. W. SHED, PHŒNIXVILLE, PA.

The specifications for bridge steel are usually not severe. The main difficulty is to secure a material which will roll easily, without showing signs of cracking on the corners of the blooms or on the flanges of the beams. In many mills sulphur has been deemed the most harmful constituent in this respect. It has been thought hazardous to roll steel containing over 0.07 per cent. of sulphur. Yet in making steel for the Phœnix Iron Company I have produced from stock running as high as 0.13 per cent. of sulphur a material which rolled very satisfactorily. It is reasonable to infer that the injurious effect of sulphur can be neutralized to a great extent by proper treatment in the open-hearth furnace, and the following notes from my usual practice here may be of interest to those obliged to use high-sulphur stock. The steel made at Phœnixville in the 20-ton furnaces has about the following composition:

	Per cent.
Carbon	0.15 to 0.20
Manganese	0.50 to 0.60
Sulphur	0.11 to 0.13
Phosphorus	0.04 to 0.06
Silicon	0.01 to 0.02

* Read at the Colorado meeting of the American Institute of Mining Engineers.

The best running heats were made with a small amount of pig-iron. In using large proportions of pig the quantity of ore is also increased. This not only cuts the bottom, but also lengthens the time required to bring the charge down. Up to 50 per cent. of pig may be used, but 25 per cent is much better. A 40,000-pound charge, containing 10,000 pounds of pig and 30,000 pounds of Bessemer butts or beam-scrap, works very well.

This is melted as quickly as possible. When every particle of the charge is thoroughly melted and the bath is hot ore is added. If the ore is added before the charge is all melted the cold ore chills the partly-melted metal and much time and heat are needed to make the bath perfectly fluid again.

In a charge containing 25 per cent. of pig 1000 pounds of hematite ore are usually required to bring the carbon to 0.16 per cent. This amount is weighed out and "feeds" of 200 pounds each are put in as fast as possible, the temperature of the bath being kept up. With the bath in good condition all the ore may be put in within one hour. During the addition of ore there should be a lively action throughout the metal, and before all the ore has been put in an energetic "boil" should be visible all over the bath. The heat on the metal is now gradually increased, and the lively action is kept up for nearly an hour. With the decrease in carbon the intensity of the action diminishes and the slag becomes thicker and more viscous. At the end of one hour after the last addition of ore the bath becomes very quiet, the bubbles of gas foamed are few and break slowly through the slag The metal if exposed to view presents a clear, silvery appearance. A test taken at this time usually breaks with a bright, coarsely-crystalline fracture, showing considerable toughness. The carbon is near the 0.16 per cent. point. If it be a few hundredths higher the slight action in the bath will soon bring it to the desired point without further addition of ore. In case it be necessary, however, to add ore at this stage, sufficient time should be allowed after the ore has entirely disappeared for the bath to become tranquil before pouring. Steel treated in the furnace in this way should remain perfectly quiet in the molds when poured.

The ferromanganese in small pieces is shoveled into the ladle while the stream is running out of the furnace. This method of adding ferromanganese is most economical. The old way of throwing it into the furnace took twice the amount of ferromanganese to give the same percentage of manganese in the finished metal. In making low steel I have noticed a loss of two-thirds of the manganese when added to the bath before pouring. By adding ferromanganese in the ladle the loss is practically nothing. This steel seems to work better when poured cool; but a large number of hot heats have rolled very well. The temperature of the ingot when bloomed down is a good red heat, noticeably colder than is the usual practice. The steel is top-poured, making ingots 15 x 18 inches in size, and weighing 4200 pounds each.

The following physical tests were taken at random from a large number of heats:

Physical Tests of Open-Hearth Steel. (Test-Pieces 8 in. long, ¾ in. in diameter).

No.	Tensile strength. Per sq. in.	Reduction of area. Per cent.	Elongation. Per cent.	Carbon Per cent.
1	57,100	65.3	25	0.15
2	64,100	62.6	26¾	0.18
3	61,200	61	31¼	0.18
4	66,700	53.8	24½	0.21
5	66,700	49.3	23¾	0.19
6	60,000	55.1	26¼	0.15
7	60,800	58.7	24¼	0.13
8	67,500	46.3	24¼	0.16
9	69,260	45.4	22½	0.22
10	60,320	54.1	30	0.17

It will be noticed that the increase in the percentage of carbon is not always followed by an increase in tensile strength.

The Iron Age

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The Copper Situation.

The announcements that the grand copper combination has been completed have been premature, to say the least. The general plan has been worked out, however, and there really seems to be some propect that it will be given a trial. There is always a possibility, of course, that there will be some hitches over the details, and that some concerns may not be induced to enter into the pool, probably acting in the belief that they may take advantage of its benefits without bearing any of its burdens. So far as can be ascertained at this writing none of the mines to be heard from are individually very large, but at least one of them is important enough to create a feeling of discomfort. With few exceptions, however, the American companies appear to have fallen into line, the large holders of copper, to whom the load carried by the Société des Métaux and the Comptoir d' Escompte was transferred, seem willing to co-operate, and some headway has been made with the great European companies. It is not to be wondered at that the American companies give least trouble. They are supposed to be able to take care of the home market without much danger of interference. The special device by which this is to be done is the old pool sale arrangement of the days of lake supremacy, expanded to include the Montana and Arizona mines. To prevent any irregularities the Lake copper is all to be sold pro rata by a New York broker and the casting brands by a Baltimore firm. The doling out of the metal to consumers and the establishment of prices is to be in the hands of an autocratic committee composed of Colonel Livermore, of the Calumet and Hecla mine; J. B. Haggin, of the Anaconda, and W. Keyser, who is identified with Arizona interests. It appears that fines are to be inflicted to punish any infractions of the agreement. One cause of irregularity which grew out of the interest of one mine in a copper rolling-mill has been removed, through the fact that the mill in question has joined the association of copper manufacturers. Even with a few of the smaller mining companies enjoying the fruits which fall to the lot of free lances, the plan seems quite capable of outliving dangers to its existence for a while, provided that the price is kept moderate, and provided that the foreign markets are kept in shape.

The bulk of the stock of copper here and abroad is controlled by great banking houses. It is stated that the Banque de France is carrying 60,000 tons, the Rothschilds 40,000 tons, the Banque de Paris 25,000 tons and Baron Hirsch 20,000 tons. Besides, the Barings have a large stock of Montana copper, the Boston and Montana Company continuing to deliver their output on the old Société contracts to that banking concern. The holdings of the Rothschilds are considered to be well taken care of, since that house are now virtually the owners of the great manufacturing plants of the Société des Métaux, consuming, as they do, upward of 25,000 tons of copper annually. It is understood that the present owners of Société stock in this country have agreed to ship it abroad, and undertake to keep it there, provided that the American mines will not export more than a given quantity annually, say about 30,000 gross tons. In other words, the banking houses will let us alone and turn over the American market to home producers, providing the latter will keep their shipments to Europe within bounds.

But even that concession is inadequate, so far as the American mines are concerned. They have a deep interest in the foreign markets for two reasons. Their surplus must be sold there and within certain limits prices here must follow the course of values there. Whatever agreements might be made on this side they could not long outlive free competition in Europe. It is understood that this contingency is to be met by a restriction of output on the part of the leading mines contributing to the European markets.

The whole plan is so huge and is beset with so many dangers and difficulties that few, even among the copper producers, are sanguine as to its continuance for any lengthy period. Manufacturers in this country, when the time for pool sales does come, will be offered the usual guarantees that during the time of delivery the market will be sustained. Neither they nor consumers generally will be rash enough to buy for more than their immediate wants. They have all learned to get along with very low stocks and will not change their policy so long as the prices are kept much above the 10 per cent. level.

Trade Prospects with American Nations.

With the approach of the Congress of American nations, to be held in Washington in October next, the outlook for our business relations with them during the season opened July 1 is a matter of no small concern to all interested. All the republics will send representatives except Paraguay, Santo Domingo and Hayti, which may still appoint delegates. The debates will be closely watched, and it is to be hoped may lead to some practical results. At any rate circumstances are propitious so far as crop prospects are concerned and with them the business outlook. Our own crops, despite some drawbacks on this coast, are bountiful, and they are so in tropical America, in spite of some disappointment about the Brazilian coffee crop. Not only the coffee and sugar planters are well to do, but other industries flourish, like, for example, the gathering of India-rubber. Copper in Chili and hides in the Argentine Republic are about the only exceptions.

On casting a retrospective glance at the business the United States did with American nations during the last two calender years the following gratifying progress appears:

	Domestic exports (in thousands of dollars).		Imports (in thousands of dollars).	
	1888.	1887.	1888.	1887.
Countries South..	72,093	66,725	184,462	176,634
Countries North..	35,979	35,849	45,684	41,658
Totals.....	108,072	102,574	230,146	218,292

Total Trade.

	1888.	1887.
South	256,555	243,359
North.....	81,663	77,507
Totals.....	338,218	320,866
Domestic exports.....	108,072	102,574
Imports.....	230,146	218,292
Totals.....	338,218	320,866

From the foregoing statistics it appears that our domestic exports to southern countries increased during the calendar year 1888 no less than 8 per cent., while our imports thence increased 4 per cent.; that our domestic exports to British America remained stationary, while in the imports thence there was a gain of 9 per cent.

The Argentine Republic received last year $6,146,000 of domestic American goods, against $5,911,000 in 1887. Real estate and building are so active there that during the fiscal year ended June 30 we shipped thither 118,332,000 feet of lumber, against 82,875,000 feet the previous year. Brazil received in 1888 $8,161,000 worth of domestic goods, against $7,104,000 in 1887. The drought in Ceara and the emancipation of the slaves, together with an immigration of 120,000 Europeans per annum, cause an extra demand for American flour and provisions, hence our export to Brazil is steadily on the increase. In spite of the short coffee crop Brazil will have a supply of 5,900,000 bags for the current campaign, against 5,400,000 bags that will be required, and the price is still high in New York, being 18½ cents. Sugar crop prospects are fair. The India-rubber crop increased from 7598 tons in 1878 to 15,725 tons in 1888. The United States now consume between 32,000,000 and 37,000,000 pounds of rubber annually. Cuba imported last year $10,990,000 of American goods, against $9,146,000 in 1887. A great impulse has been given to sugar-planting since the price improved, so that the next crop may considerably exceed previous ones. Central sugar-houses multiply under an infusion of American capital; our sugar machinery meets with a ready market. Mexico took last year American merchandise to the extent of $9,607,000, against $8,370,000 the previous year. The rapid communication by rail stimulates the use of all sorts of American products. Hayti received $3,954,000 worth of our goods, against $3,763,000. Peace now being restored, American flour and provisions will be the first thing required, and there is time enough for the gathering of the new coffee crop. The British West Indies received $7,787,000, against $7,007,000. Sugar crops are doing well. The remaining Spanish-American countries, most of them producers of coffee, sugar and cocoa, are in a normally prosperous condition; their takings of American goods will certainly not diminish, but are, on the contrary, likely to augment. In the coffee producing countries especially the agricultural classes as well as the people at large are able to dispose of ready capital not unlikely to ten times the extent than was the case only three years since. The result is the straightening out of national, provincial and municipal finances noted on all hands, the revival of railroad building and harbor improvements and the successful floating of many new loans in Europe. Even Peru is able to turn over a new leaf. Central America is more alive

than ever, and it will not take more than a year or two to complete continuous rail connection between New York and San José de Guatemala. In two years Buenos Ayres and Valparaiso will be connected by rail via Mendoza across the Andes. The Brazilian railway system, in connection with the vast rivers intersecting it, is to be completed from the Amazon down to the Rio Grande do Sul; the next five years will be devoted to carrying out this scheme. Cuba, Chili, Paraguay, Bolivia and Peru are all ready to carry out new railroad and river navigation enterprises. From all appearances the era of revolutions is closed, arbitration is to take the place of wars arising from border disputes and peace reigns supreme everywhere. All the better for our future business relations down there, and—prospectively—for the New York exhibition of 1892. It fortunately so happens that the regeneration of South America coincides with the earnest efforts we are making to foster more intimate and more profitable relations with the countries named. Everything, indeed, argues well in this respect.

Contemplated Changes in Ocean Mail Routes.

The original scheme for the establishment of a complete mail route between England, Japan, China and Australia via the Canadian Pacific Railway is supposed to be approaching its actual realization. In Montreal the recent favorable action of the House of Commons with reference to a contract submitted by the Canadian Pacific Railway Company for a monthly steamship service across the Pacific ocean is regarded as insuring the success which the inhabitants of the Dominion so earnestly desire. The contract provides that the service between Halifax in winter and Quebec in summer will be one continuous and complete service at intervals of four weeks, the vessels to call at Yokohama and Shanghai, and the period of transit between Halifax and Hong Kong to be 732 hours, and between Quebec and Hong Kong 684 hours. The run between Quebec and Hong Kong will thus occupy 28½ days, and between Liverpool and Hong Kong about 36 days. Penalties are provided for failure to start a boat or train at the appointed date, and for failure to accomplish the distance in the prescribed time. The contract will run for ten years. For this service the Canadian Pacific Company will receive $500,000 per annum, of which it is understood the Canadian Government will contribute one-fourth. On the part of the Imperial Government the considerations of greatest weight are that the land transit will lie wholly within British territory, that as a military route it may prove invaluable; and the requirement that the mail steamers shall be convertable into armed cruisers, accords with the policy recently adopted with reference to steamships in the Atlantic mail service, the new White Star steamer Teutonic being the pioneer steamer of the new type. It is also in contemplation to extend the mail service by the Canadian routes to Australia and New Zealand, in which case a diversion of the British mails from San Francisco to Vancouver is more than probable. The regular departures from Vancouver to Hong Kong are expected to commence January 1, 1891, if not at an earlier date. What effect the new arrangements may have on the American Pacific mail service can only be conjectured. If private enterprise should prove inadequate to the maintenance of an independent mail line under the American flag would Congress humbly acquiesce in the substitution of the Union Jack? But the British have already captured the Atlantic trade with only a mild remonstrance. Why not let them have the Pacific also?

Recent Failures in Cotton and Wool.

A succession of heavy failures among manufacturers of cotton and wool, the first of any consequence dating back only about one month, proves to have been more serious than was thought before the facts were so well known as at present. The large house of Lewis Brothers, of Philadelphia, agents for several mills, failed with liabilities which are now currently rumored to be between $6,000,000 and $7,000,000, instead of about $4,000,000, as originally reported. Close following this embarrassment A. D. Juilliard, of New York, placed an attachment for $412,000 on the Riverside Oswego woolen mills. Then Brown, Steese & Clarke collapsed, and the suspension and assignment of the Riverside Oswego quickly followed. These combined troubles have brought into discredit an important line of commercial paper, affecting various trades, the liabilities of the Wauregan cotton mill, in Connecticut, alone amounting to over $1,000,000, of which $400,000 are held by Providence banks. Five mills in Rhode Island are involved, besides others of minor consequence in New York and elsewhere. In the New York dry goods trade these events are said to have caused "a painful impression," emphasizing the fact that goods for several seasons have been selling at prices too low. The effect upon credits generally is unfortunate by bringing single-name paper into disrepute. Boston banks last week cut down their loan account $1,250,000, and loans by the associated banks in New York were contracted $3,500,000, so that indorsed bills receivable are practically out of the market. The contraction, however, is largely due to the movement of funds to the interior for crop purposes. Mill troubles, as is well understood, have their origin in causes lying back of the present season. The exceptional mildness of last winter, attended with a large production and light subsequent demand, brought about a heavy indebtedness which dealers, agents, jobbers and manufacturers alike have been compelled to bear. When they have once caught the alarm bank officers are only too apt to be unreasoning in their distrust of the condition of the particular trade affected. The failures in Eastern Pennsylvania may easily be construed into evidences of weakness and lead to widespread consequences, were it not quite generally known that the iron trade has undoubtedly passed the critical period, and is in a sounder condition than it has been for a long time, a few special branches possibly excepted.

It is stated that all the builders now constructing vessels for the new navy are under penalty for non-compliance with the time item of the contracts. The vessels were to have been completed on or before a certain date, and a penalty of so much for each day's delay over the specified time is exacted. At the Quintard Iron Works, New York, the gunboats Concord and Bennington are each under a penalty of $50 per day; the Columbia Iron Works, of Baltimore, are losing $200 a day on the Petrel, which, although finished, has not yet been accepted by the Government; at the Cramps the Baltimore is under a penalty of $100 a day and the Vesuvius under $200, and at the Union Iron Works, of San Francisco, the Charleston is under a penalty of $100 a day because of the delay. It is not possible that this clause in the contracts will be rigidly executed. Should the exact terms be insisted upon the builders of future boats will pursue one of two courses. They will endeavor to have the time extended, or, failing in that, they will provide for the penalty by incorporating it in their bid, which will be increased proportionately. This, of course, will be at the expense of the Government. Since the building of war-vessels in this country is a practically new industry, it would be unwise on the part of the Government to insist too rigorously on a clause which in no way influences the character of the boat and which has no bearing on the public welfare.

High or Low Speed Engines.

Engineers are divided in their opinions regarding the best system of motive power to be used in electric-light stations, whether high or low speed engines. Both methods have warm advocates, and each can point to model stations to demonstrate the soundness of his reasoning. At the recent convention of the National Electric Light Association two papers were read which described thoroughly the equipment of a model electric-light station. Both papers were in favor of the low-speed engine. One urged that the motive power should consist of twin engines of the Corliss type, non-condensing, connected at right angles and running at about 40 revolutions per minute. It was also stated that the low speed engine used less coal and oil, required less attention, and cost less for repairs than several small high-speed engines doing the same work. The second paper described an engine of the triple-expansion type, running at a speed of 100 revolutions per minute.

As the aim of these papers was to describe two actual stations and not to picture an ideal plant, no comparison was made between different methods and arrangements. But in a paper recently read before the Engineers' Club of St. Louis on steam plants for electrical service, we find the principal features of both systems of driving brought forward and discussed Undoubtedly the first and most important requisite, and one which depends more directly upon the engine than upon any other part of the entire plant, is that of reliability. With electric lighting, as with any other public service, the stoppage of the current even for a short period will do more damage financially than can be repaired by months of successful operation. The condition is more imperative in this case than in any manufactory where a cessation only affects the convenience of the owner and his customer. It is more

difficult to explain the cause and to pacify a thousand than it is to convince one.

The third paper we have mentioned reviews the claims made for each of the two systems. The large slow-speed engines are usually arranged to belt to countershafts on which are friction-clutch pulleys, from which the dynamos are driven. Generally two engines are employed, one connected with each end of the shaft. The other system employs several small independent high-speed engines coupled direct to the dynamos.

The advantages claimed for the first system are thus enumerated: "First, the long-stroke engine, with four independent valves, represents the highest known steam efficiency and requires smaller boiler-plant and less outlay for fuel. Second, the use of shafting and clutch-pulleys admit of the greatest interchangeability. Any dynamo can be run from any engine and a dynamo or engine can be thrown in or out of service without affecting the rest of the plant."

The advocates of the direct connected engines present the following points:

1. That no power is lost in driving shafting. 2. That as stations are actually run under widely varying loads, the small engines can be operated at or near their best point of cut-off, and will therefore do the work at less fuel cost per lamp hour. 3. That one or two dynamos to an engine offer all necessary interchangeability. 4. That one small engine affords ample reserve. 5. That electrical conditions demand close regulations of speed from stroke to stroke and under changing load and steam-pressure, and that experience has shown that this is best secured by high-speed engines. 6. That a short circuit in a dynamo would slow down a small engine, thus giving warning of danger, while a larger engine would pull it through regardless of results. 7. That the plant occupies the least space; and, last, but by no means least, the first cost, including erection and foundations, is less than for low-speed engines with shafting, &c.

Considering the two plans the author finds that the countershaft is a source of weakness, as an accident to it disables the whole plant. This means a serious loss of power and crippling of the plant, which would not be caused by the throwing out of one of the small independent engines. In regard to economy, the water consumption of the low-speed engines is placed at about 20 per cent. less than that of the high-speed, but the greater friction in the shafting of the former offsets much of the gain in the engine itself.

Another assential item is the load. If this is constant and near the working capacity of the engine, the low speed is the more economical. For loads having wide variations the detached engines are cheaper, and when the load is very small the loss due to friction is much reduced, as only engines needed for the work are run. It appears that, under certain circumstances, the low-speed engine is to be preferred, while in other surroundings the independent engines are thought better. We may add that some of the most prominent incandescent lighting companies prefer the independent high-speed engines.

In the issue of *The Iron Age* of August 15 a brief allusion was made to the fact that negotiations were pending for the purchase of a large iron-works, on the part of English capitalists. This week the publication is made in local papers of a notice that on September 10 the stockholders of the Thomas Iron Company would be called upon to vote on a proposition to sell their property. It is this great concern to which we referred at the time, a concern which has been phenomenally prosperous. The pioneer in the successful manufacture of pig-iron with anthracite as fuel, the Thomas Iron Company have paid on an original capital of $300,000 not less than $3,800,000 in dividends, earning last year considerably more than the 10 per cent. on their stock which they paid to their stockholders. During their existence they have acquired by purchase and have extended their plant until now they possess valuable ore property in Eastern Pennsylvania and New Jersey, and have the largest furnace plant in Eastern Pennsylvania. If the stockholders give the representatives of the English capitalists the 60 days' option for which they have asked and the latter pay the price demanded, the stockholders parting with their shares have received at the rate of nearly $9,000,000 for their original investment made about 40 years since. We learn, however, that there is not much prospect that the sale will go through, the price asked, about $5,500,000, being considered too high. An amusing contribution to the gossip on the subject comes in the shape of a rumor that really the English people have nothing to do with the matter, but that the greedy buyers are people who are driving at a pig-iron trust.

OBITUARY.

HENRY SHAW.

One of the oldest hardware merchants of St. Louis, one of the most opulent and honorable, Henry Shaw, the philanthropist, died in that city the 25th inst. Arriving in this country from England at the age of 19 years, he located in St. Louis. He first embarked in the hardware business and for a time was proprietor, clerk and porter. He also gave some attention to Indian supplies. He prospered and after 20 years of commercial life had amassed a sufficient fortune to enable him to retire from business, which he did at the age of 40. He went abroad and visited nearly every quarter of the globe, being away from this country about ten years. It was upon his return that he commenced the study and cultivation of plants and flowers, and it was in the prosecution of these studies that the now world-famous botanical gardens had their origin. With the death of Henry Shaw the gardens become the property of the State of Missouri. Another and perhaps more valuable munificence was the gift to the city of Tower Grove Park, a resort of peculiar beauty. Mr. Shaw's estate is valued at $2,500,000, and it is thought the greater part will be left to the city of St. Louis in various bequests.

SAMUEL H. RANSOM.

A veteran of the stove trade, Samuel H. Ransom, of Albany, died in that city the 27th inst., aged 71 years. He was a director in the New York State Bank and a trustee in Dudley Observatory.

JACOB MILLER.

Jacob Miller, at the head of the large agricultural works of E. Aultman & Co., died at Canton, Ohio, the 21st. inst., aged 65 years. He was interested in the Akron Iron Works and other important enterprises.

The Pottstown Iron Company, of Pottstown, Pa., are putting ground basic slag on the market as a fertilizer.

The Coal Consumption of Ocean Racers.

The enormous consumption of fuel on the new ocean racers is a serious drawback to their success financially, unless they are running full of passengers, so that already fears are expressed that enterprise in this direction is going too far. To lay them off is to lock up temporarily a large amount of capital, throwing away for the time being the entire investment. Charles G. West, superintendent of the French line, said to a reporter: "The trouble about the racing boats is that to get a comparatively small increase in speed and power a terrible amount of room must be sacrified and a great increase made in running expenses. Look at the fast Cunarders, burning some 350 tons of coal a day to get across in six days. I believe some of the other racers eat up even more fuel, especially at this season of the year, when they have to be in racing trim all the time. I went over to see the Columbia when she was on inspection after her maiden passage, and I found that not only were the bunkers full of coal, but some of the steerage compartments had also been closed up and filled with coal. They were bound, you see, to get every possible pound of power out of the engines. It isn't the coast of the coal alone, though that will average $5 a ton, but it is the room the extra coal takes up and the extra men necessary to handle it and the room they take up. It takes a regiment of stokers to shovel 400 tons of coal a day into furnaces. Every man costs from 90 cents to $1 a day, besides his board and lodging. When it comes to freight the racers don't get it. The Cufic burns, they say, only 135 tons of coal a day, and she makes the passage in 10 days or so. You can imagine the profit there is in a boat like that. Then the old Adriatic of the same line gets along with 85 tons a day, and makes the passage plenty fast enough for freight. She's a regular gold mine beside these new racers." It is notorious that to get out of a steamship the extra speed necessary in making a six-day passage trebles the consumption of fuel. Only under the most favorable traffic conditions, therefore, is it possible for the racers to run profitably. But this class of vessels have a hopeful outlook in prospect of the great New York Exposition of 1892.

The Pittsburgh committee of freight agents decided last week to advance all east-bound iron and steel rates, to go into effect on Monday, September 2. The reason for the change is the general revival of the iron business. The following are the new figures. The first-named are for less than carload and the last for carload lots: To New York, 18 and 15; Utica, 16 and 13; Philadelphia, 16 and 13; Baltimore, 15 and 12; Boston, 21 and 18; Albany, 18 and 15; Syracuse, 16 and 13; Rochester, 14 and 11; Portland, Me., 26½ and 22½ cents per 100 pounds.

The eighth annual convention of the National Association of Stationary Engineers will be held at Detroit, September 3 to 7. Judging from present indications this meeting will be the most successful ever held. The corresponding secretary of the association is Charles A. Sink, of Detroit, Mich.

The Edison General Company, as now organized, have a capital of $12,000,000, and plans are being worked out looking to the building of central stations throughout the country.

The Minneapolis Art and Industrial Exhibition was opened 21st inst. with an oration, Vice-President S. C. Gale in the chair.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, August 26, 1889.

Pig-Iron.—There was no perceptible change in the market last week. The general foundry men and car-wheel makers are constantly in the market for such quantities as their business requires. The largest sale reported was a lot of 1000 tons to a Milwaukee consumer. Orders for lots of Charcoal and Coke Irons ranging from carloads to 300 tons were distributed among the dealers, so that all were doing something, but none of them a very rushing business. The tone of the market continues quite firm, and yet there are elements which enter into transactions that interfere with a uniform range of higher prices on Charcoal Irons. On Iron delivered by rail there is very little difference in price, but where the furnace and points of consumption are such that deliveries can be made by water, buyers are able to get some brands of Iron below the regular price for that grade. The furnace selling the Iron gets full market value, but the advantage gained by the consumer on freight rates may reach 50¢ to 75¢ ℔ ton on several hundred ton lots, and on cargoes perhaps $1 ℔ ton. These circumstances may explain how to account for rumored low figures on Charcoal Iron, and at the same time show that the furnace price was not cut, and that all consumers cannot purchase on the same basis. Local Coke Irons are firm and less subject to circumstantial influence. Since the furnace at Cummings began making Bessemer the supply is short, and the Chicago Furnace Company are virtually out of the market on No. 1 and have very little of the other grades to offer. The current demand consequently falls upon the Bay View furnaces, and they have advanced their prices 50¢ ℔ ton on Nos. 1 and 2 and $1 ℔ ton on No. 3. Ohio Soft Irons are scarce, especially Blankband, for which there is more demand than can be supplied. There is nothing of consequence doing in Southern Irons. Consumers want Gray Forge and Mottled, but makers refuse to sell at their market price, because they cannot make deliveries. All demand is for immediate shipment. There are very few inquiries for October, November or December delivery, for which time furnaces would enter orders. There is some improvement in the demand for Tennessee and Alabama Irons, which has firmed up the price on Chilly grades and made slight concessions obtainable on Foundry grades. We quote as follows, f.o.b. Chicago: Bessemer, nominally, $17.50; Lake Superior Charcoal, $18.50 @ $19; Local Coke, No. 1, $16.50; No. 2, $15.50; No. 3, $14.50 @ $15; Chicago and Bay View Scotch, No. 1, $16.50; American Scotch (Blackband), $18.50; Southern Foundry, No. 1, $16.50; No. 2, $15.75; No. 3, $15; No. 1, Soft, $16; No. 2, $15; Gray Forge, $14.50 @ $14.75; Mottled, $14; Tennessee Charcoal, No. 1, $18 @ $18.50; Alabama Car-Wheel, $24 and $25; Hanging Rock, No. 1, $18.50; Jackson County, $18.

Bar-Iron.—The condition of the market favors the seller. Mills, however, that can take orders are not refusing very many, and as a rule are asking $1.60, at mill, for Common Iron, and $1.75 for Single Refined. The demand is very good for both qualities, but there appears to be more buyers who prefer the better grade at the difference in price. The greatest advance has been made on Common Iron, and at the present cost of Old Rails the profit to makers is very narrow, so that they necessarily must get more money for the finished material. Very few of the mills would quote last week on Iron for delivery next month, as notice has been given that freight rates will be advanced September 1. Jobbers are having a fair business from store, and are now quoting 1.75¢ for Common and 1.90¢ @ 2¢ for Single Refined in small lots.

Structural Iron.—Another 16-story building is on paper and contractors are waiting details. Other small jobs have come up recently that promise to keep the makers of building shapes well engaged until late in the fall. Prices are firm, as follows, f.o.b. Chicago: Angles, 2.25¢ @ 2.35¢; Universal Plates, 2.30¢ @ 2.40¢; Sheared Plates, 2.35¢ @ 2.40¢; Tees, 2.60¢; Beams and Channels, 2.90¢. From stock on hand dealers quote Angles, 2.40¢; Tees, 2.70¢; Beams and Channels, 3.40¢

Plates, Tubes, &c.—A firm market and active trade from mill and store about express all that there is to say on all kinds of Plates. Tubes are also firm and in good request. Manufacturers quote Nos. 10 to 14 Iron Sheets at 2.40¢ @ 2.50¢; Steel Sheets, same numbers, 2.50¢; Tank Steel and Iron, 2.25¢ @ 2.35¢ at mill. The following prices are made from store: Iron Sheets, Nos. 10 to 14, 2.70¢; Steel, Nos. 10 to 14, 2.75¢ @ 2.80¢; Tank Steel and Iron, 2.50¢ @ 2.60¢; Steel Plates, Shell, 3¢; Flange, 3.50¢; Fire-Box, 4.25¢; Otis, 5.50¢; Ulster Iron, 3.75¢; Boiler-Rivets, 4¢ @ 4.25¢; Boiler-Tubes, 52½ % discount on 1¾-inch and less and 57½ % discount on 2-inch and larger.

Sheet-Iron.—If anything the market is stronger. The recent advance in price has brought out some manufacturers who can take small orders and make prompt shipments. On basis of No. 27 makers are now asking $3.05 @ $3.10 at mill. Jobbers quote small lots from store as follows: No. 24, $3.10; Nos. 25 and 26, $3.20; No. 27, $3.30.

Galvanized Iron.—Business is of fair volume from store. On standard brands jobbers quote 65 % off on Juniata and 65 % and 5 % on Charcoal, in small lots from store. Manufacturers' prices range from 67½ % off to 70 % off, according to quantity and quality. For some time there has been more or less speculation as to how manufacturers who were making the extremely low prices could get out whole on the transactions. This will probably always remain a mystery to those outside of the business, but the deception in weight, in which the consumer is directly interested, should be corrected. By comparison, it has been definitely determined that some manufacturers are putting Iron on the market that is one gauge lighter than what it is branded and sold for. By this practice the dealer gets more sheets in 1000 lb and the consumer gets material a gauge lighter than he intended. As a remedy for this evil the desirability of selling sheets by weight per square foot is being agitated by the trade.

Merchant Steel.—The market is reported active on Plow Steels, and mills from three to four weeks behind on orders. Merchant shapes are in good demand in round lots from mill and small lots from store. It is said the Gautier mill of the Cambria Company will be ready to deliver Toe Calk, Spring, Tire, Machinery, Sleigh Shoe and Plow Steels in about two weeks. Manufacturers quote, f.o.b. Chicago: Soft Steel Bars, 1.90¢ @ 2¢; Spring and Tire Steel, 2.25¢; Toe Calk, 2.30¢ @ 2.40¢; Open-Hearth Machinery, 2.75¢; Bessemer Machinery, 2.10¢ @ 2.15¢. Jobbers quote as follows from store: Mild Machinery, 2.10¢ @ 2.20¢; Tool, 7.75¢ @ 8.50¢; Open-Hearth Machinery, 3¢; Bessemer Machinery, 2.40¢ @ 2.60¢; Tire, 2.30¢; Sheet, 7¢ @ 10¢.

Steel Rails.—Prices on Steel Rails have been advanced rather suddenly to $32 for heavy sections, and $34 @ $35 for light weights. Orders have been refused where deliveries were required earlier than November. Several round lots are under negotiation for delivery during the winter and early spring. If the deals are consummated the mills in this vicinity will be pretty well engaged all winter.

Track Supplies.—The demand for Splice-Bars has perhaps had more to do with the rapid advance in the price of Old Rails than any other class of material. As a result prices are firm and makers not pressing for new orders. Quotations are as follows, f.o.b. Chicago: Steel Splice-Bars, 1.90¢ @ 1.95¢; Iron Splice-Bars, 1.80¢ @ 1.85¢; Spikes, 1.95¢ @ 2¢; Bolts, Square Nuts, 2.50¢ @ 2.55¢; Hexagon, 2.60¢ @ 2.70¢.

Old Rails and Wheels.—Judging from the manner Old Rails advanced last week many of the consumers must have been caught very short of stock. The demand came from nearly all points of consumption as far East as Pittsburgh. Early in the week $23 was offered and refused. This subsequently resulted in the sale of 1000 tons at $24. On Thursday another sale was made at figures equivalent to $24.50, Chicago. Small lots changed hands at various prices between these extremes. On lots in sight holders are asking $25. Long lengths Old Steel Rails are quoted at $18, and short pieces at $15. The demand for Old Wheels does not appear to be very urgent. Speculators are offering $18 and have the stock pretty well corralled. On round lots to consumers holders are asking $18.50 @ $19.

Scrap-Iron.—In comparison with the demand for Rails, there is very little doing in Scrap material. Dealers are firm in their prices, and railroads have refused $18.50 for No. 1 Wrought. There is some demand for mill grades from consumers, and also for Car-Axles and light and heavy Steels. Dealers' quotations are as follows ℔ net ton: No. 1 Forge, $18.50 @ $19; No. 1 Mill, $14.50 @ $15; No. 2 Mill, $9 @ $9.50; Car-Axles, $23.50 @ $24; Horseshoes, $19; Splice-Bars, $20; Wrought Turnings, $12; Axle Turnings, $13; Wrought Pipe, $14; Locomotive Tires, $16.25; Leaf Steel, $15.25; Coil, $14.50; Cast Machinery, $12; Stove-Plates, $9; Cast Borings, $8.75.

Hardware.—Merchants are doing a lively business. Their trade is increasing every week. Country dealers are buying their fall and winter goods unusually early. Jobbers are maintaining prices exceedingly well, and manufacturers are not offering jobbers inducements for orders. The Manufacturers' Steel Goods Union was dissolved last week. There is still in existence an agreement that will prevent the cutting of prices on this year's business.

Nails.—The market on immediate business appears to be very firm. Manufacturers are asking, and presumably getting $1.75, at mill, for Steel Nails. It is said that jobbers have large stocks on hand or under contract, and therefore are not in the market now. Wire Nails are less firm. Makers have recently named $2.20, f.o.b. Chicago, on round lots. Jobbers are quoting on mixed carloads $2.30 for Wire Nails and $1.85 for cut Steel Nails. Small lots out of store are quoted at $2.35 for Wire Nails and $1.90 @ $2 for Cut Nails.

Barb Wire.—With the exception of a steadily-increasing demand, there is no change to note. Jobbers quote 3.35¢ for Galvanized and $2.75 for Painted in small lots from store.

Pig-Lead.—Transactions were limited and the market consequently weakened. Sales of about 300 tons are reported at $3.75. Consumers are now bidding $3.70 for early delivery.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., August 27, 1889.

Pig-Iron.—The market remains in pretty much the same condition as noted a week ago. New business has not been of any great importance, but prices are hardening, so that the absence of large transactions cannot be considered an unfavorable feature. Producers find that their entire output is being absorbed in a legitimate way, so that they have no uneasiness in regard to the renewal of contracts. If stocks were accumulating or if postponement of deliveries were being asked for the feeling would be different, but the difficulty is more in the direction of scarcity than of oversupply. In addition to this there is the increase in cost of production and advancing markets all around, so that the immediate influences are all in favor of higher rather than lower prices. Buyers are not altogether indifferent either. Constant inquiries are being made, and although the usual reply is that prices are too high, there is quite a chance that some of these options may be accepted all of a sudden, leaving the furnaces with very little room for casual orders. In the aggregate, these small orders are always an important item, but are much more so in periods of activity like the present. Of course it is impossible for any one to say with certainty what will happen within the next three months; but men of the greatest experience consider the position unusually favorable for a material advance, while there is apparently not the slightest chance in the opposite direction. To-day's prices are somewhat unsettled, for the reason that sellers are ready to take immediate alarm in case large orders are offered to them, but for moderate quantities quotations would be from $17.50 to $18, at tide, for No. 1 Foundry, $16.50 @ $17 for No. 2, and $15 @ $15.50 for Gray Forge. Southern Irons are held at about $15 @ $15.25 for rail shipments of Gray Forge, and $17 @ $17.50 for No. 1 Foundry; and while small lots are taken there is no urgency to sell except in a limited way.

Blooms.—The demand has been very active during the past week, but orders are hard to place unless at more or less of an advance. Some mills are entirely out of the market, others ask a full $2 advance, while here and there may be found one willing to accept $1 advance, but the market is very uncertain and quotations liable to be withdrawn at any moment. For the present, however, the following fairly represent the market: $29.50 @ $30, delivered, for Nail Slabs; $32 @ $33 for Tank Slabs; $34 @ $35 for Shell Slabs; $37 @ $39 for Flange, and $40 @ $42 for Fire-Box; Charcoal Blooms, $52 @ $54; Run-out Anthracite, $42.50 @ $43; Scrap Blooms, $32.50 @ $33.50 ℔ "Bloom" ton of 2464 lb

Muck-Bars.—Prices feverish and unsettled. Sales have been reported at $30, delivered, but $29.50 is probably a fair average of the market, although some hold for $30 and over. In other cases $28.50 @ $29, at mill, has been named, but as we said before, prices are very unsettled and liable to change from day to day according to supply and demand.

Bar-Iron.—There is not much change to note in this department, although prices are firm and the demand very active. The mills are all crowded with work, but, as consumers' requirements are covered for the present, there is nothing specially urgent offering, hence for the time being a somewhat quiet market. Prices are steady, although showing a good deal of irregularity, due perhaps partly to quality or to reputation or to the amount of work on hand. Some say 1.80¢ is all they can get for Refined Bars; others either get from 1.85¢ to 1.90¢ or let some one else take the business. Taking the Bar trade as a whole, mills are better employed, and their owners are more independent in regard to prices than they have been for years.

Skelp Iron.—There is a heavy demand for both grooved and sheared, but buyers and sellers appear to differ in regard to prices. Buyers think they can afford to wait a brief period before placing their orders, and, as sellers have plenty of work to go on with, they, too, feel equally independent. Asking prices, 1.87½¢ @ 1.90¢ for Grooved, and 2.15¢ @ 2.25¢ for Sheared. Bids from a half-tenth to a tenth below these figures.

Plates.—Mills are kept busy to their fullest capacity and prices are gradually advancing. Steel seems to be taking its movement toward higher prices, the advance being about a tenth during the past couple of weeks. It is more than ordinarily difficult to give exact quotations, as manufacturers, in times like these, are measurably independent of each other, so that what one might accept another might just as readily turn away. The following, however, are as near the market as can be given. Some might ask a trifle more, others might shade a little, according to the condition of their order-books: 2.15¢ @ 2.2¢, delivered, for Ordinary Plates and Tank Plates; 2.20¢ @ 2.25¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.25¢; Fire-Box, 3.7¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.23¢ @ 2.35¢; Shell, 2.6¢ @ 2.7¢; Flange, 2¾¢ @ 3¢; Fire-Box, 3¼¢ @ 4¢.

Structural Material.—Mills are very full of work, and it is a difficult matter to place orders for prompt deliveries. The outlook seems to improve daily, and an abundance of work and firm prices may be regarded as fully assured for the balance of the year. Quotations are nominally unchanged, but as already stated it is difficult to place orders. We quote as follows: Bridge Plate, 2.15¢ @ 2.20¢; Angles, 2.10¢ @ 2.20¢; Tees, 2.6¢ @ 2.7¢; Beams and Channels, 2.8¢ for Iron or Steel, all delivered at Philadelphia or its equivalent.

Sheet Iron.—There is some little easing up in the demand, although mills still have all the orders they can handle for some time to come. Prices are steady at last week's figures, say for carload lots:

Best Refined, Nos. 14 to 20	3¢
Best Refined, Nos. 21 to 24	3.20¢
Best Refined, Nos. 25 to 26	3.40¢
Best Refined, No. 27	3.50¢
Best Refined No. 28	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¼¢
Best Soft Steel, Nos. 21 to 24	3½¢
Best Soft Steel, Nos. 25 to 26	3¾¢
Best Soft Steel, No. 27	4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount	65 %
Common, discount	67½ %

Steel Rails.—The market is developing a good deal of strength, and prices are firm at $30 at mill, for fall delivery. Winter work might possibly be placed at $28.50 @ $29, but the feeling is strongly in favor of higher prices, and as the increased requirements of buyers are presented, the tendency will be to name figures in proportion to the demand. Mills are already crowded with orders for Blooms, Billets, &c., and are therefore not in condition to increase their product of Rails, as they otherwise would be.

Old Rails.—There is a good deal of inquiry, but buyers and sellers are wide apart in their ideas of value. Sellers ask $25 and upward, while about $24 is the usual bid price. Latest sales were at $24.50 @ $25, delivered in consumers' yards.

Scrap-Iron—There is an improved demand, but prices have not responded in proportion to other specialties To day's prices are about as follows: $21 @ $21.50 for cargo lots; $21.50 @ $22 for carload lots, delivered; or for choice, $22.50; No. 2 do., $15 @ $16; Turnings, $14 @ $15; Old Steel Rails, $16.50 @ $17.50; Cast Scrap, $15 @ $16; do. Borings, $9 @ $10; Old Fish-Plates, $23 @ $24; Old Car-Wheels, nominal, $17 @ $18, Philadelphia.

Nails.—There is no special change to note, except that the demand is more active and prices steadier. The output is somewhat restricted and better prices are looked for in the near future, although at present $2 from store and $1.85 @ $1.90 for carload lots appear to be about fair average quotations.

Wrought-Iron Pipe.—The demand continues to be satisfactory and prices are very firm. The outlook is excellent for the fall trade, with discounts as follows: Butt-Welded Black, 50 %; Lap-Welded Black, 62½ %; Butt-Welded Galvanized, 42½ %; Lap-Welded Galvanized, 50 %; Boiler-Tubes, 52½ % @ 57½ %, according to size.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, August 27, 1889.

There is a large volume of business and prices are still tending upward. Never before in the history of the Iron trade of Pittsburgh was every furnace and mill so fully employed as at present. A number of firms, including Carnegie, Phipps & Co., are increasing their capacity, which is the best evidence that businsss is in a healthy condition.

Pig-Iron.—There has been a good demand during the week, especially for future delivery, and a large volume of business has been offered. Prices have further advanced, and it is the opinion of some of our posted operators that the danger line has about been reached. Brokers were here from Cincinnati the latter part of last week offering Southern Iron, but so far as we can learn they did not meet with much success. They wanted almost as much for it as the home Iron was offering at, and consumers here will not buy it unless at a price considerably below that ruling for the home-made article. There was considerable Southern Iron sold in this market prior to the Interstate Commerce law, but since then the increase cost of transportation has shut it out of this market. As compared with the lowest point, Mill Irons have advanced from $1.50 to $1.75 ℔ ton, and Bessemer from $2 to $2.25. We quote as follows:

Gray Forge Neutral	$15.00 @	$15.50,	cash
All-Ore Mill	16.00 @	16.50,	"
White and Mottled	14.00 @	14.50,	"
No. 1 Foundry	16.75 @	17.00,	"
No. 2 Foundry	15.50 @	16.00,	"
Charcoal Foundry	20.00 @	22.00,	"
Cold Blast Charcoal	24.00 @	27.00,	"
Bessemer Iron	17.75 @	18 00,	"

Several blocks of Bessemer, amounting in the aggregate to 10,000 to 12,000 tons, were reported at $17.75, $17.85 and $18, cash; and No. 1 Mill is now held at $15.50 @ $15.75, cash.

Muck-Bar—There appears to be less inquiry, and while we quote at $28 to $28.50, cash, we know of no actual sales above $28, but some makers are asking $28.50 and refusing to sell for less.

Ferromanganese.—Sales reported at $62 @ $63 for 80 %.

Manufactured Iron.—Demands continue good; mills are all pretty fully employed and prices are firm and tending upward. While Pig-Iron has advanced almost $2 ℔ ton the products have not gone up much more than one-half, and it is not strange, therefore, that manufacturers are wanting better prices. We continue to quote upon a basis of $1.70 @ $1.80 for Bars, 60 days, 2 % off for cash.

Skelp-Iron has advanced more than any other kind, because the demand for it is more urgent; Grooved is quoted at 1.75¢ @ 1.80¢, and Sheared at 2.10¢ @ 2.20¢. The mills making a specialty of Skelp are all oversold, and some of them have contracts made a good while ago when prices were much lower.

Nails.—The market for Cut Nails continues in an unsettled and unsatisfactory condition; while the price remains unchanged at $1.90, 60 days, 2 % off for cash, it is doubtful whether makers would be willing to make contracts for future delivery upon the basis quoted. The cost of production has been largely increased by the enhanced cost of Slabs, which have advanced $1.50 @ $2 ₱ ton, and it looks very much as if Nails would have to go higher if there is any demand at all. It is well to bear in mind that many jobbers here and elsewhere were pretty well filled up some time ago, when prices were considerably lower. Wire Nails remain unchanged at $2.25, 60 days, 2 % off for cash.

Wrought-Iron Pipe.—The situation remains much the same; Pipe mills are all as busy as they can be, some of them having contracts booked to absorb their entire output during the remainder of the year. No change in prices, but they are very stiff at the combination rates, and an advance is not improbable at the September meeting of the association, which takes place in Pittsburgh. Discounts on Black Butt-Welded Pipe, 50%; on Galvanized do., 42½%; on Black Lap-Welded do., 62½%; on Galvanized do., 50%; Boiler Tubes, 1¾ inch and smaller, 52½%; 2-inch and larger, 57½%; Casing, 5⅜-inch, 60%.

Old Rails.—While there have been no sales of Old Iron reported above $25, they cannot be laid down here from any sources of supply either East or West at the price it is said that Chicago is now wanting, $24.50 there, which would make them cost about $26.50, delivered in Pittsburgh. There has been a lot stored here for several years that cost $28, and it begins to look as if the owner thereof would possibly be able to get out after awhile without loss. Old Steel Rails are also in scant supply and firmer, quoted at $18.50 @ $19 for short and $20 @ $21 for long pieces.

Billets, Blooms, &c.—Bessemer Steel Billets continue very firm, with mills all oversold and considerable inquiry. We now quote at $29 @ $29.50, cash; Nail Slabs, in the absence of sales, may be quoted at $28.50 @ $29; Rail Crops are still quoted at $19 @ $19.50, and Bloom Ends at $18.50 @ $19.

Railway-Track Supplies.—There is an increasing demand and prices are stiff and likely to go still higher. Spikes are quoted at 2.10¢, 30 days, but are likely to go higher any day, and the same is true of Splice Bars and Track Bolts.

Steel Rails—Are quoted for winter delivery at $28 @ $29, cash, at mill.

Old Material.—Is firmer, with an increasing demand. No. 1 Wrought Scrap, $20 @ $20.50, net ton; Wrought Turnings, $13 @ $14; Old Car-Axles, $24 @ $25; Cast Scrap, $14.50 @ 15, gross; Old Car-Wheels, $18 @ $18.50. Sales of Old Stove Plate reported at $13, gross ton.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, August 26, 1889.

Pig-Iron.—There has been no change in the tone of the market, which remains firm and conservative, with a slight tendency, however, toward an upward movement in prices. Orders from old customers would be taken at present prices, but new buyers would probably be raised at least 25¢, especially if the amount wanted ran up into the several hundred tons. Several of our furnaces have no Iron to sell; in fact, are now much behind their contracts. None of the furnaces are piling up stock excepting those who are holding for an advance in prices. Some little is being placed in warrant yards, which system, although not a favorite one with the furnaces in general, is yet a sort of a steadier of the markets. Just at the present time the demand for Forge grades especially is very active, perhaps more so than Nos. 1 and 2 Foundry. Taking a general view of the situation there is no part of the United States but what is now calling for Pig-Iron, and it would seem as though every consumer is anxious to get the Iron into yard as soon as possible. This, perhaps, may be in a measure accounted for from the fact that the time is near at hand when thousands of cars will be called for to move the immense cotton crop, which has already commenced moving in some of the lower counties, and which will far exceed in amount any previous year in the history of the South. Then will come the tug of war with those who will be wanting quick shipments of Pig-Iron, and it would be well for such to anticipate their wants for the next three or four months. The three new stacks of the DeBardeleben Steel Company, at Bessemer, will go into blast very soon. The Citico, of this place, went out during the past week for relining; will probably go in again early in October.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, August 26, 1889.

Pig-Iron.—There is no change to note in the condition of the market. Demand continues strong and prices firm with an advancing tendency. Some fair sized orders were placed during the past week and those who have been holding off, looking for a slump in the prices, are now placing their orders, having come to the conclusion that quotations are more likely to be advanced than otherwise. The consumption of Iron is daily increasing, and with an unusual amount of work in the building line in view, furnaces are not anxious to push the sale of their product, but prefer selling not over a few weeks ahead, so as to be in a position to take advantage of any increase in values. Foundry Irons show considerable strength, the demand being unusually heavy and sellers have no difficulty in securing full prices. For ordinary-sized lots we quote as follows, for cash, f. o. b. St. Louis:

Southern Coke, No. 1 Foundry,	$15.75 @ $16.00
Southern Coke, No. 2 Foundry,	14.75 @ 15.50
Southern Coke, No. 3 Foundry,	14.50 @ 14.75
Gray Forge	14.00 @ 14.25
Ohio Softeners	17.00 @ 19.00
Lake Superior Charcoal	20.00 @ 21.50
Missouri.	
Charcoal Foundry, No. 1	16.25 @ 16.50
Charcoal Foundry, No. 2	15.00 @ 15.50
Tennessee.	
Charcoal Foundry, No. 1	17.50 @ 18.00
Charcoal Foundry, No. 2	17.00 @ 17.50

Connellsville Coke, f.o.b. East St. Louis, $4.40; St. Louis, $4.55.

Bar-Iron.—There appears to be no abatement in the demand for Bars, and mills are consequently being worked to their full capacity. Prices are strong, and should the demand continue, which seems quite likely, a further advance will be in order. For the present we quote as follows: Lots from mill at from 1.70¢ to 1.75¢; small lots from store at from 1.80¢ to 1.85¢.

Barb-Wire.—The improvement in demand noted last week continues to be the feature of this department, and mills are experiencing some difficulty in making prompt shipments. Complaints are made, however, in regard to prices, but with a continuance of the demand the chances are favorable for advances later in the season. Jobbers quote as follows: From 2.75¢ to 2.80¢ for Painted, and from 3.35¢ to 3.40¢ for Galvanized; carload lots at from 2.65¢ to 2.70¢ for Painted and 3.25¢ to 3.30¢ for Galvanized, f.o.b. St. Louis.

Detroit.

WILLIAM F. JARVIS & CO., under date of August 26, 1889, say: The market has not only shown strength, but the week just past has been an exceedingly active one, and especially has this been the case with Lake Superior Charcoal. The advance reported last week has been fully maintained and several round lots disposed of at the higher prices. A number of furnaces have been compelled to withdraw from the market, being entirely sold up for all they can deliver before the close of lake navigation. The only Irons that are still offering at former quotations are Coke Foundry, and a few sellers claim to have obtained higher prices for special brands of these grades, but only for small quantities from regular customers, who prefer not to change for 25¢ @ 50¢ ₱ ton. Shipments have been very heavy, partly owing to the fact that railroads have given notice of advance in rates on September 1. With a strong active market we quote as follows:

Lake Superior Charcoal, all numbers	$19.20 @ $19.75
Lake Superior Coke, all ore	18.00 @ 18.50
Lake Superior Coke, cinder mixed	17.50 @ 18.50
Standard Ohio Black Band	17.50 @ 18.50
Southern No. 1	16.50 @ 17.00
Southern Gray Forge	15.00 @ 15.50
Southern Silvery	16.00 @ 16.50
Jackson County (Ohio) Silvery	18.00 @ 18.50
Old Wheels	18.00 @ 19.00

Cleveland.

CLEVELAND, August 25, 1889.

Iron Ore.—The continued demand for new Ore has induced both the furnacemen and mine-owners to withdraw their original estimates of 6,500,000 tons as the probable output of Ore for 1889 and to place the figures at 6,750,000 or 7,000,000 tons. The receipts of Ore at lower Lake ports during the past seven days aggregated 264,000 tons—the second largest week in the history of the Ore trade. The receipts to date exceed 4,150,000 tons, and, if the present activity is maintained until the close of navigation, the amount of Ore brought down from the Lake Superior district during the season will have reached the higher figures in the estimate given above. There have been rumors within a day or two of private charters at $1 from Escanaba, $1.25 from Marquette and $1.35 or $1.40 from Ashland and Two Harbors, the vessels to run until the close of navigation, but the reports are not confirmed. Plently of single-trip carriers at 90¢ from Escanaba, $1.10 from Marquette and $1.25 from Ashland and Two Harbors can still be engaged. The sale of a small block of Champion Ore at a 25¢ advance over the price fixed early in the season is reported. Gogebic Bessemers are commanding $4.75 @ $5 and Ore from the Menominee Range the same figures. Few non-Bessemer Ores are left unsold, fully a dozen orders for 2000 and 3000 ton lots having been placed during the past week. For the remaining lots scattered about here and there $4 ₱ ton is asked. The market has maintained a remarkable steadiness throughout the season, despite the tremendous sales, which undoubtedly aggregate, if indeed they do not exceed, 5,300,000 tons.

Pig-Iron. — The market is steadily improving in every way. The demand for Bessemer and Mill Iron is very heavy, and a 50¢ advance over last week's quota-

tions is readily obtained. Foundry Irons, while in better demand, are commanding better prices than prevailed a month ago. Quotations are as follows:

Nos. 1 to 6 Lake Superior Charcoal	$20.00 @ $20.50
No. 1 Strong Foundry, ₽ ton	16.00 @ 16.60
No. 1 Strong Foundry, Bessemer quality, ₽ ton	17.00 @ 17.50
No. 1 American Scotch, ₽ ton	16.00 @ 17.00
No. 2 American Scotch, ₽ ton	15.00 @ 16.00
No. 1 Soft Silvery, ₽ ton	16.50 @ 17.50
Mahoning and Shenango Valley Neutral Mill Irons, ₽ ton	14.50 @ 15.00
Mahoning and Shenango Valley Red Short Mills, ₽ ton	14.50 @ 15.50

Manufactured Iron.—The market is active and prices are advancing. Common Bar-Iron now brings 1.75¢ from store and will probably command 1.80¢ before the close of the week. Sheets are scarce and only obtainable at fancy prices.

Scrap-Iron.—Selected Axles, at $25 @ $26, are selling freely. Old American Rails bring $24 readily enough, but Old Wheels, even at $17.50, are not in much demand.

Louisville.

LOUISVILLE, KY., August 26, 1889.

Pig-Iron.—There has been very little Iron sold during the week. Prices, however, have remained very firm, as there has not been much Iron offered for sale, and heavy buying elsewhere, it is thought, will cause an advance shortly. The trouble on account of Coke in the Birmingham district is curtailing the production there, and it is expected also that some furnaces will go out of blast shortly for repairs, which will further reduce the output and have a tendency to strengthen the market. Several leading Southern furnaces are ov old for deliveries running through this year, so offerings from there will be very small. The report of Western Pig Iron Association shows that stocks of Coke Iron have decreased some 26,000 tons during July, and the reduction of stocks in August are reported to be much greater. Current quotations are as follows:

Southern Coke, No. 1 Foundry	$15.00 @ $15.50
Southern Coke, No. 2 Foundry	14.50 @ 15.00
Southern Coke, No. 3 Foundry	13.75 @ 14.25
Gray Forge	13.25 @ 13.75
White and Mottled, different grades	12.75 @ 13.25
Silver Gray, different grades	13.25 @ 13.75
Southern Charcoal, No. 1 Foundry	16.50 @ 17.00
" " No. 1 Mill	15.00 @ 15.50
Southern Car-Wheel, standard brands	22.00 @ 23.00
Southern Car-Wheel, other brands	18.25 @ 19.75
Hanging Rock Coke, No. 1 Foundry	15.75 @ 16.25
Hanging Rock Charcoal, No. 1 Foundry	19.75 @ 21.25
Hanging Rock, Cold Blast	21.00 @ 23.00

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. CINCINNATI, August 26, 1889.

Pig-Iron.—There has continued to be a good demand for Car-Wheel Iron in the local market for Pig-Iron during the week under review, but of all grades Gray Forge has sold most freely, and a firm tone has prevailed, although at the close there are reports of some sales having been made at a cut rate. Foundry Iron has sold more readily, especially the lower grades. Mottled Iron has been much sought, but has been obtained only in moderate amounts. Silvery Iron has continued scarce. There have been no new features of importance calling for special comment. Generally a confident tone has prevailed and full prices have been obtained for both round and small amounts. Prices are without quotable change but the tendency is toward an enhancement of value. Among the sales reported during the week are 4000 tons No. 3 Southern Foundry at $14, 3000 tons No. 2 Soft at $13.75, and 1000 tons and 600 tons Gray Forge at $13.50, cash, 2000 tons Southern Car-Wheel at $23.50, cash. At the close there were reported sales of 2800 tons Gray Forge at $13.25, but there are also reports that this partnership sale was not below $13.50, the recognized level of the market. Several hundred ton lots of Mottled have sold at $12.75 and $13, cash. The following are approximate prices current here at the close for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1	$15.25 @ $15.50
Southern Coke, No. 2	14.50 @ 14.75
Southern Coke, No. 3	13.75 @ 14.00
Ohio Soft Stone Coal, No. 1	16.00 @ 16.50
Ohio Soft Stone Coal, No. 2	15.00 @ 15.50
Mahoning and Shenango Valley	16.00 @ 16.50
Hanging Rock Charcoal, No. 1	20.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 21.50
Tennessee and Alabama Charcoal, No. 1	17.50 @ 18.50
Tennessee and Alabama Charcoal, No. 2	16.50 @ 17.50
Forge.	
Gray Forge	13.25 @ 13.50
Mottled Neutral Coke	12.50 @ 12.75
Cold Short	@ 13.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	23.00 @ 24.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.00 @ 20.50

Manufactured Iron.—There has been quite a satisfactory movement in Bar and Sheet Iron during the week, orders from safe manufacturers being much increased. Carriage-builders have been less free buyers, but orders from other sources have been sufficient to compensate for such decline. A firm tone has prevailed and full prices have been charged, but the general range has not been altered.

Nails.—The market has remained firm in tone, with a fair order demand. Iron and Steel Nails, 12d to 40d, sell at $1.85 @ $1.90 ₽ keg, with 10¢ rebate in carload lots, at the mills. Steel Wire Nails sell at $2.40 for 60d.

Old Material.—There has been less demand for Old Rails here, but the offerings have been light, and the nominal rate at the close is $24, cash. Old Wheels have been quiet under a light supply, and are nominally quotable at $19, spot cash.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, August 27, 1889.

American Pig.—With the approaching close of the holiday season greater activity is being displayed. The leading sellers reported some round transactions, which in many cases cover deliveries up to the close of the year. The Thomas Iron Company report having sold several thousand tons of No. 1 Foundry, the proportion of that grade which the furnaces are making being unusually heavy for this season of the year. The Tennessee Coal and Iron and Railroad Company announce that after September 1 the price will be advanced 25¢ a ton. Quotations are as follows: No. 1 Anthracite Foundry, at tide-water, $17 @ $18; No. 2, $16 @ $17; Gray Forge, $15 @ $15.75; Southern No. 1 Coke Foundry, delivered at New York, $16.50 @ $16.75; No. 2, $15.25 @ $15.50; No 3, $15 @ $15.25.

Scotch Pig.—Very little business is transpiring, and quotations remain nominally at $20 @ $20.50 for Eglinton; Dalmellington, $20.25 @ $20.50; Summerlee, $22.25 @ $22.50, and Langloan, $22 @ $22.50.

Spiegeleisen and Ferro.—The only transaction of any magnitude reported is the sale of a moderate lot of special brand, 20 %, equivalent to $29.80, ex-ship New York. Cables make Ferromanganese higher, and importers are now asking from $61 to $62 for 80 %.

Wire Rods.—The situation is growing more and more difficult for those manufacturing Wire who have not got their own Rod mills. With the finished article, notably in Wire Nails, at a low figure, and no chance for a lessening of cost of Rods for some time to come their position is very serious. There is a chance of some relief in the Rod market, when with the approach of winter the demand for Barb Wire drops off.

Finished Iron and Steel.—The demand continues quite active, inquiries reaching this market for Bars, for instance, from points which are at other times competitive. In structural material the Madison Square Garden work is soon expected in the market, while in Plates the demand for ship-building continues We quote as follows, on dock: Sheared Plates, 2.15¢; Universal Mill Plates, 2.20¢ @ 2.25¢; Angles, for the smaller sizes, 2¢ @ 2.10¢; for larger sizes, 2.25¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢. In Plates, Steel Tank is 2.3¢ @ 2.35¢; Shell, 2.5¢ @ 2.6¢; Flange, 2.75¢ @ 2.8¢; Fire-Box, 3.25¢ @ 3.75¢. For Bars we quote: Common, 1.6¢ @ 1.65¢, Medium, 1.65¢ @ 1.7¢, and Refined, 1.8¢ @ 2¢. Hoops, 2¢ @ 2.1¢; Galvanized Sheets, 65 % and 5 %.

Steel Rails.—No sales of any consequence have taken place during the week under review, so far as the leading Eastern mills are concerned. There are quite a number of inquiries in the market, but many of them are hardly in such shape as to be eagerly sought after by the mills. Quotations for delivery in the West, made on the basis of about $28 at Eastern mill, have met with figures equivalent to about $30 in Chicago, and $29 in Pittsburgh. Up to the first of this month the sales for 1889 delivery aggregated about a little over 1,080,000 tons, this total of course including only standard Rails and only the mills in the association. The deliveries, however, up to that date had been only about 675,000 tons. This may be interpreted to indicate that the mills must have considerable work before them. That such is the case with some of them there can be little doubt. Others are not inclined, even when they have the opportunity, to load up with new business at present rates, say $27.50 @ $28 in large blocks at Eastern mill, since they are convinced that the tendency is decidedly upward. If crops turn out as good as they promise now, and the demand is to be as urgent for our surplus in Europe as reports indicate, the railroads will soon be in a condition to pay for much-needed renewals. Even the most prosperous railroads have been economizing sharply in this direction and the demand thus accumulated must be enormous. It will require very little new mileage to make those mills very full of work who are in a position to roll Rails for less than $32, with Pig-Iron at $18.

Old Rails.—Inquiries are numerous, but there has been no business so far as we can learn. Bids have gone as high as $24, but the majority of sellers ask $24.50 and upward for Tees.

Scrap.—There is an encouraging inquiry for No. 1 Wrought Scrap, and considerable business has been placed, the ruling price being $20 @ $20.50, or $21 for Choice, delivered at Jersey City. Cast Scrap is selling at $15 on cars.

Metal Market.

Copper.—During the week under review the London market improved from £42. 5/ Spot Copper to £43. 10/, and futures from £41. 10/ to £42; sales 700 tons. Messrs. James Lewis & Son, Liverpool, in their circular of August 16, remark: The presence of a leading representative of the American producers in London and Paris has led to reports of fresh negotiations with the liquidator of the Comptoir d'Escompte and the present holders of the large stock for a limitation of production, so that the stock may be

gradually reduced without detriment to the value of Copper. Since January 1, the import into Liverpool and Swansea of American Copper was 16,311 tons fine, against 17,139 in 1888, and 6856 in 1887. Spain exported during the first six months 475,023 tons of Pyrites, against 418,720 in 1888, and 403,061 in 1887; of precipitate, 14,771, against 13,541 and 13,745. Our own market has remained featureless at the pool figures to consumers of 12¢ for Lake, 11½¢ Arizona and Montana, and 10½¢ Casting brands. In a jobbing way the figure for Lake is 12½¢ @ 12¾¢. We treat the subject of the Copper situation at some length editorially in another column.

Tin.—London improved for the week from £90, spot, to £91. 7/6, and futures from £90. 15/ to £92. 5/; sales, 300 tons. Our own market has developed greater activity, with sales of altogether 100 tons at 20.40¢ August and 20.50¢ September. Spot Tin closes at 20½¢ @ 20⅝¢. Twenty-five tons, deliverable first week in September, sold on the Metal Exchange at 20.35¢ *Tin-Plates.*—We have had a moderate demand; the dealers are trying to get better prices, in which, however, they do not always succeed, and are still willing to meet buyers more than half way. A cable dispatch states that Coke Tins advanced from 13/6 to 13/9 at Liverpool. We quote large lines, ordinary brands, ℔ box: Siemens-Martin Steel, Charcoal finish, $4.75 @ $5.50; Coke finish, $4.60 @ $4.65; Ternes, $4.12 @ $4.30; Coke Tins, $4.30 @ $4.35, and Wasters $4.10 @ $4.12½.

Lead—Has been very dull indeed at 3.80¢ @ 3.85¢, at which 200 tons were sold in the open market, the nominal closing quotation being 3.85¢ @ 3.90¢. St. Louis is quiet at 3.65¢ @ 3.70¢ and Chicago at 3.75¢. Spain exported during the first six months 64,962 tons, against 65,040 tons in 1888 and 66,349 tons in 1887.

Spelter.—Some 300 tons August, September and October delivery were sold in the open market during the week at 5.10¢ @ 5.15¢, together with some choice lots at 5.25¢ @ 5.30¢. St. Louis quotes 5¢, 4.90¢ being declined, the market closing very firm at the figures named. We quote Silesian 6.40¢ in consequence of the advance in Europe. Spain exported during the first six months 12,721 tons of Calamine, against 16,601 in 1888 and 17,634 in 1887, showing a steady decrease.

Antimony—Has evinced great steadiness at 18½¢ @ 19¢ for Cookson's, and 16½¢ @ 16¾¢ Hallett's.

New York Metal Exchange.

The following sales are reported:

THURSDAY, August 22.

25 tons Tin, November..... 20.10¢
25 tons Tin, first half September..... 20.15¢

FRIDAY, August 23.

15 tons Tin, September..... 20.15¢
25 tons Tin, December..... 20.20¢
10 tons Tin, August..... 20.20¢
10 tons Tin, August..... 20 25¢

MONDAY, August 26.

50 tons Lead, spot..... 3.85¢

TUESDAY, August 27.

10 tons Tin, September..... 20.50¢
50 tons Tin, August..... 20.40¢
15 tons Tin, October..... 20.40¢

WEDNESDAY, August 28.

25 tons Tin, first week September..... 20.35¢

Financial.

In a review of business conditions during the past week favorable features decidedly predominate. Crop advices are no less flattering, and coupled with this fact is a report from the Vienna Grain Congress which makes the wheat crop of Europe 15 % less than last year, and the shortage of Russia, Austria, Hungary and Roumania 160,000,000 bushels. Exports of grain and provisions are on a liberal scale, attended with a remarkable Eastward movement from Chicago, shipments of various commodities from that point showing a larger increase than ever before. Shipments of grain were 5,452,000 bushels; provisions, 7,000,000 pounds; live-stock, 184,000 head. Aside from the railway movement an increased amount of freight is going by the lakes, owing to advanced charges for land transportation. Another factor of no mean consequence is the influence exerted by Judge Cooley's decision that the Northwestern lines are not acting in accordance with law and that they will not be allowed to proceed further in their course. The roads which recently put into effect a low proportional tariff have already restored their rates and have renewed negotiations with the view of securing uniformity. Canadian competition must be endured until such time as Congress shall provide a remedy.

The stock market dragged until Monday, when a bullish feeling was more apparent. News of reduceed rates for sterling imparted a stronger undertone and better supplies of money relieved the apprehensions of stringency. In the Vanderbilts, grangers, coal shares and Northern Pacifics trading was large, and the announcements that the Treasury had accepted $1,500,000 bonds gave another impetus to the market. Earlier in the week the Northern Pacifics were affected by the news that the directors had agreed upon the plan for a blanket mortgage for $160,000,000. On Tuesday all the advantages gained on the previous day were maintained. The only event was the announcement that $5,395,000 more bonds had been bought, without change of price, as fixed by Secretary Windom. They were all registed 4 per cents and were supposed to have come from the so-called bankers' pool. Thus the Government has released from the Treasury during the past seven days over $11,000,000 by the purchase of bonds of an aggregate par value of $9,318,200.

The general merchandise markets are somewhat quickened. An advance in wheat on Monday was based on a reported shortage in Europe and a fair export demand. In spot the advance for the day was 1¼¢. Breadstuffs firmer. Corn tends downward. Cash pork ruled easier under a light demand. Sugars are at a stand. Coffee firm. Lard is in a better position. Tobacco firm. Cotton is steady with 25,000 bales engaged for export. Ocean frieghts higher. Wool quiet. In dry goods trade was active with jobbers, business being such as to indicate a large and prosperous fall season.

United States bonds were steady and quoted as follows:

U. S. 4½s, 1891, registered	105¾
U. S. 4½s, 1891, coupon	106⅞
U. S. 4s, 1907, registered	128
U. S. 4s, 1907, coupon	128
U. S. currency 6s	118

The weekly statement of the associated banks showed a decrease in all the items. The loans were reduced $3,491,100, which, together with a reduction of $3,168,900, cash, mainly accounted for a decrease of $7,529,500 in deposits. The surplus reserve was reduced $1,286,525, bringing it down to $2,066,000. Exports of specie for the week were only $335,000, but the drain for crop movements in the West continued. On Monday an easier condition was noticed in the money market, partly as the effect of sterling loans negotiated in Europe. Sterling exchange showed a sharp reaction, the posted rates dropping to $4.84½ @ $4.87½. Cotton bills were also offered more freely and sold down to 4.82¢ for September and 4.81¢ for November, suggesting the possibility of an influx of gold, but this is premature, as the rates for sterling bills are still at least 2¢ above the point at which specie can be imported with a profit since the recent failures in the woolen trade. The liabilities of Lewis Brothers, it is surmised, may reach $6,000,000 or $7,000,000, while the schedule of Brown, Steepe & Clark, of Boston, shows $1,180,000 liabilities. The National Association of Wool Manufacturers meets in Boston September 17 to consider the interests of the trade. The activity of general business is shown by the statement that the total bank clearings of 43 cities last week increased nearly 18 % over last year, the increase outside New York having been 8.⅗ %. New York increased 23.5, Boston 2.5, Philadelphia 12, Chicago 6.6, St. Louis 8.2, Baltimore 21.7, Pittsburgh 14.9, Cincinnati 11.2, New Orleans 44.3, Louisville 30.3, Milwaukee 21.8, Indianapolis 11.8, St. Paul 21.3, Omaha 24.2, Detroit 19.1, Denver 54.8, Columbus 25.8. The money situation was further improved by a free offering of bonds to the Treasury at the old prices, viz., 128 and 106⅞ for 4s and 4½s, respectively. Since August 3, 1887, the Treasury Department has purchased $62,948,500 4 % bonds and $116,930,600 4½ % bonds, or a total of $179,879,100. These bonds cost $207,135,093; at maturity they would have cost $243,648,746; so that the Government has made a saving of $36,512,653. Time contracts on stock collateral were quoted at 5 % bid for 30 days and 6 % for any period from 60 days to the end of the year. Commercial paper was of very slow sale, no city banks doing anything and Eastern institutions being entirely out of the market. Rates are 5½ % @ 6 % for 60 to 90 day indorsed bills receivable, 6 % for four months acceptances, and 6½ % @ 7½ % for good single names having from four to six months to run. Certain classes of mercantile paper are severely scrutinized.

The foreign commerce of the United States for July shows that the new fiscal year opens with a large increase of exports, but not in a ratio corresponding with the still heavier imports in the merchandise account for July of this year, the imports exceed the exports $18,531,235; in the specie and bullion account the exports exceed the imports $5,307,758, leaving the total imports $13,223,447 in excess of the total exports. The following shows the total imports and exports of all the ports of the United States for the past seven months of the calendar year to July 31:

	1888.	1889.
Exports merchandise	$356,266,816	$413,931,223
Exports specie	35,106,102	69,165,136
Total exports, seven months	$391,372,918	$483,096,359
Imports merchandise	$431,999,472	$463,117,614
Imports specie	12,643,237	15,889,706
Total imports, seven months	$444,642,709	$479,007,320
Balance of trade	$53,269,791	$4,089,039

For the first seven months of 1888 the imports exceeded the exports $53,000,000. For the first seven months of the current year the exports are in excess $4,000,000. This difference between the two years is partly due to the increased shipments of produce, but chiefly comes from the increased outflow of specie and bullion, which amounts to $69,000,000 for the last seven months, against $35,000,000 for the corresponding period of the previous year.

Exports from New York for the week were $7,250,000.

Among a lot of steel-armor protective-deck plates rolled by the Linden Steel Company, of Pittsburgh, Pa., tested by the Government inspectors, one showed a tensile strength of 74,640 pounds and an elongation of 32 per cent. in 8 inches. The plate was 1 inch thick, which makes the result obtained still more remarkable.

Coal Market.

The Anthracite Coal trade remains in the same congested condition noted for some time past, although relieved somewhat by an increase of orders under the stimulus of cooler weather. The bulk of business, however, it may reasonably be assumed, awaited the outcome of the meeting appointed for to-day, at which no change was made. An official is quoted as intimating that the regular fall demand being already narrowed down to a few weeks, the companies are liable to be taxed beyond their abilities, and should they take advantage of the pressure by making Coal dear they would be exposed to abuse. Sales of Stove Coal at $4, alongside, are reported, and even lower quotations are heard.

The Delaware and Hudson Canal Company and the New York, Lake Erie and Western Railroad Company will be called to answer before the Interstate Commerce Commission to the charge of unjust discrimination in the shipment of Coal. Simpson & Watkins, of Scranton, Pa., are the complainants, and they are desirous of shipping Anthracite Coal from their collieries to various points in New York, but they aver that they are unable to do so by reason of their inability to procure from the respondent a rate of freight which would enable them to market their Coal at the said points in New York State and retain for themselves, after paying the freight charges of the respondent, a sum sufficient to represent either the cost or the current market value of their coal. They charge that the respondent maintains a practical monopoly of the Anthracite Coal trade over its line, and that it is carrying Bituminous Coal over like distances in the same direction between points in the Anthracite Coal fields at rates per ton per mile which the petitioners believe to be about one-third the rates charged on Anthracite. Discrimination in the use of cars is also charged.

The Bituminous trade is unchanged. Cars are scarce, which causes vessel freights to weaken.

The Coke operators in the Pittsburgh district have decided to advance the price of Coke to $1.25 ℔ ton and probably more on September 1.

The Reading Company report a decrease in Coal tonnage for week ending August 24, 1889, as compared with corresponding period in 1888, of 34,370 tons, and for year to date an increase of 179,983 tons.

The first Coal train over the Poughkeepsie Bridge crossed August 26.

Imports.

Hardware, Machinery, &c.

Boker, Carl F., Mdse., cs., 6
Boker, Hermann & Co., Hardware cs., 19; Anvils, 2; Arms, cs., 46; Mdse., cs., 5
Colwell Iron Works, Steam Traps, bxs., 8
Curley, J. & Bro., Cutlery, cs., 2
Dejonge, J. & Co., Mach'y, cs., 4
Downs, Wm., Mach'y, cse., 1
Downing, R. F. & Co., Iron-Ware, cse., 1
Field, Alfred & Co., Arms, cs., 39
Foley, Ed., Mach'y, pcs., 23
Folsom Arms Co., Arms, cs., 5
Guild & Garrison, Mach'y, bxs., 5
Graef Cutlery Co., Cutlery, cse., 1
Hartley & Graham, Arms, cs., 31
Henderson Bros., Mach'y, cse., 1
Linge, G. S. & Co., Mach'y, cse., 1
Loose, Seman & Co., Macy'y, cs., 2
Merchants Despatch Co., Arms, cs., 16; Mach'y, cse., 1
Morgan Engineering Co., cse., 1
O'Halloran, D. W., Mach'y, pcs., 8
Oastler, W. C., Mach'y, cs., 2
Pim, Forwood & Co., cs., 3
Sheldon, Geo. W. & Co., Guns, cs., 16
Smith, J. H., Mach'y, cs., 19
Stoddard, Lovering & Co., Mach'y, cs., 21
Schoverling, Daly & Gales, Arms, cs., 20
Stamir & Laffey, Mach'y, cs., 8
Thebaud Bros., Mach'y, box, 1
Whitman, Clarence, Mach'y, cs., 16
Vom Cleff & Co., Iron-Ware, cs., 13
Werlemann, H., Arms, cs., 48
Wilson, J. W. & Co., Mach'y, pcs., 3
Wiebusch & Hilger, Trim., Guns, cs., 31; Mdse., 11
Ward, Jas. E., Mach'y, box, 1; do., cs., 3; Dog Spikes, cs., 100
Ward, Asline, Mdse., cs., 4
Order: Mach'y, cs., 17

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, August 28, 1889.

In the market for Block Tin there has been litttle activity, but the tendency is firmer, and the present level of prices is judged to be low, unless there are free arrivals soon from the alleged invisible supply at the Straits. Prices have improved about £1. 5/ during the week, but are a shade off from the highest point to-day.

Copper weakened somewhat owing to heavy sales, causing flatness. The subsequent recovery failed to stimulate interest and the market at present is narrow. Cash warrants at present are scarce, being locked up by French holders and outsiders, and are about £1. 10/ over futures. There have been further liberal sales of furnace material, including 720 tons Anaconda Matte at 8/6, and 350 tons Montana Matte at 8/4½. Little value is attached to reports of an agreement between producers and large holders, about which so much has been talked of lately.

In the absence of any definite movement by either buyers or sellers trade in Tin-Plate has been rather small. The element of cost of production is embarrassing to large contracts, being enhanced by the augmented price of Steel Bars and firmness of makers. Some buyers seem willing to place orders at a moderate advance, anticipating a further rise. The Menthyr Gadly's works are likely to be restarted.

Pig-Iron warrants experienced a setback early in the week, but subsequently recovered, owing to a belief that the advance in price of fuel and probable further rise on makers' Iron will favorably affect warrants. Most brands are 6d @ 1/ up and Middlesboro' Pig and Hematites are also held at a further advance. Makers' prices for Rails are up 2/6, but there has been no change on other Steel. The Manufactured-Iron trade continues brisk and prices are up 5/ on Welsh Bars.

Scotch Pig.—Higher prices generally asked, but business has been rather quiet at the advance.

No. 1 Coltness,	f.o.b.	Glasgow	61/
No. 1 Summerlee,	"	"	59/6
No. 1 Gartsherrie,	"	"	58/6
No. 1 Langloan,	"	"	59/6
No. 1 Carnbroe,	"	"	51/
No. 1 Shotts,	"	at Leith	59/
No. 1 Glengarnock,	"	Ardrossan	56/
No. 1 Dalmellington,	"	"	49/
No. 1 Eglinton,	"	"	47/6

Steamer freights, Glasgow to New York, 4/; Liverpool to New York, 10/.

Cleveland Pig.—Business has been larger in this line at slightly advanced prices. No. 3 Middlesborough quoted 43/9, prompt.

Bessemer Pig.—There is still a brisk demand and the market remains strong. West Coast brands, mixed numbers, 55/, f.o.b. shipping point.

Spiegeleisen.—The demand continues good and prices are firm. English 20 % quoted 82/6, f.o.b. at N. W. England shipping point.

Steel Rails.—There is a good business and the market is firm at 2/6 advance. Heavy sections quoted at £5 and light sections £5. 5/ @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—The demand moderate but prices firmly held. We quote £4. 7/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—A fairly active business with prices firm. Bessemer, 2½ x 2½ inch, £4. 12/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—The market remains quiet but firm. Bessemer, £4. 15/, f.o.b. at N. W. England shipping point.

Old Rails.—Buyers and sellers far apart. Business moderate. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads £3. 10/ @ £3. 15/, c.i.f., New York.

Scrap-Iron.—Prices firmly held, but the demand moderate. Heavy Wrought quoted £2. 5/, f.o.b.

Crop Ends.—The market quiet and prices unchanged. Bessemer quoted £2. 15/ @ £2. 17/6, f.o.b.

Tin-Plate.—A fair business doing and prices firm. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/3 @ 15/6
IC Bessemer Steel, Coke finish	13/6 @ 13/9
IC Siemens " " "	13/9 @ 14/
IC Coke, B. V. grade	15/1½ @ 13/3
Charcoal Terne, Dean grade	12/ @ 12/6

Manufactured Iron.—There is still a good business and prices remain very firm. We quote, f. o. b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars				@	8	10	0
" Common "				@	6	17	6
Staff. Bl'k Sheet, singles				@	8	15	0
Welsh Bars (f.o.b. Wales)	6	12	6	@	6	15	0

Copper.—The market fairly active; prices very firm for named brands. Merchant Bars quoted at £43. 10/, spot, and £42. 5/, three months' futures. Best Selected, £48. 10/.

Tin.—Fairly active market; prices somewhat irregular. Straits quoted at 91. 5/, spot, and £92 for three months' futures.

Lead.—A fair business doing at steady prices. Quoted £12. 12/6 for Soft Spanish.

Spelter.—There is still a good demand and prices are strong. Quoted at £21. 15/ for ordinary Silesian.

Foreign Markets.

EQUIVALENTS

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds
Kilogram	2.205
Picul	134.

EAST INDIES.

MANILA, August 19, 1889.—*Hemp.*—There are buyers at $13.62½, against $10.25 ℔ picul same date last year, equaling ℔ ton, cost and freight, £43. 15/, against £33. 15/. There cleared for the United States since last cable none, against 9900 in 1888; since January 1, 144,000, against 99,000; loading for ditto, 8000, against 10,000; since January the clearances for England amounted to 176,000 bales, against 23,000 in 1888; loading for do., 2800, against 4000; cleared for all other ports, 29,000, against 47,000; receipts at all ports since last cable, 376,000 bales, against 367,000 in 1888 and 361,000 in 1887. *Freight.*—$5, against $6. *Exchange.*—Six months' sight on London, 3/5¾, against 3/5.—*Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street.*

COLOMBO, July 11, 1889.—*Plumbago.*—The scarcity previously reported continues. We quote in rupees, ℔ ton: Large lumps, 145 @ 170; ordinary ditto, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Exportation has since October been distributed as follows: To England, 127,819 cwt.; to Venice, 102; to Hamburg, 7419; to Antwerp, 12,439, and to Bremen, 1254; to Holland, 457; to India, 139; to Australia, 392, and to the United States, 125,439; together, 275,140 cwt., against 202,434 in 1888, 183,331 in 1887 and 142,329 in 1886. *Coir*

Yarn.—Nos. 1 to 4 has been bringing 7 @ 13 rupees ₹ cwt. *Exchange.*—Six months' sight 1/4 9-16.—*Volkart Bros., Ceylon and Malabar Coast, through their agent in New York, Mr. John W. Greene, 82 Wall street*

SPAIN.

BILBAO, August 5, 1889.—*Iron Ore.*—Several available single cargoes have been sold, while nothing has come to our knowledge as to sales for forward delivery. The spot price remains 8/3 @ 8/6 for Campanil and 7/ @ 7/4 for Rubios Superior. At this time of the year more should be doing, but the stock of Ore is not large. Shipments hence up to July 27 were 2,285,640 tons, against 2,208,900 same time last year and 2,574,479 in 1887. *Pig-Iron*—There were shipped coastwise during the week a few trifling lots merely, and abroad 800 tons.

Shipments of Ores and Metals from Spain During the first Six Months.

	1887. Tons.	1888. Tons.	1889. Tons.
Calamine.....	17,634	16,601	12,721
Pyrites.....	403,061	418,720	475,023
Iron Ore.....2,713,763		2,375,875	2,656,171
Pig-Iron.....	59,288	34,863	28,980
Precipitate	13,745	13,541	14,771
Quicksilver.....	1.093	857	1,872
Pig-Lead	66,349	65,040	64,962
Totals.....3,274,933		2,925,497	3,254,500

The decrease in Calamine and increase in Quicksilver will be noticed.—*Bilbao Maritimo y Comercial.*

GERMANY.

HAMBURG, August 17, 1889.—*Iron.*—As both Coal and Coke are still tending upward in Rhenish-Westphalia, Pig-Iron has remained fully sustained. The price of Spiegel has been raised still further under a continued brisk home and export demand, the quotation now being 70 marks. All sorts of Pig are in lively request and in several instances an improvement has taken place, the quotations now being as follows: Forge Pig, 47 @ 64; Foundry do., 62 @ 68; White Steel, 63 @ 64; German Bessemer, 58 @ 59, and Thomas, 52 @ 53. All rolling-mill products have been rising, and no new contracts are made unless eight to ten weeks time for delivery be stipulated. Wire-Rods have also commenced looking up; the entire Wire branch is in better position than heretofore. Double T Beams may be quoted 122.50 @ 127.50; Wire-Rods, 130 @ 135; Steel Rails, 130 @ 135, ditto for mines, 130 @ 135. In Upper Silesia the supply of Pig-Iron is so inadequate that importation has to some extent to be resorted to from Hungary, Styria and Sweden. Rhenish-Westphalian Pig-Iron production has been 119,934 tons in July, against 106,247 tons in June, the sales amounting to 119,338 and 105,549 respectively, and the stock on July 31 to 44,772 tons, against 44,116 on June 30.—*Borsenhalle.*

BELGIUM.

BRUSSELS, August 17, 1889.—*Iron.*—Activity and firmness continue unabated in Belgium in the Iron and Steel branches. Although France has ceased to compete with Belgian Beams, it has been deemed advisable not to raise the price of the latter. The export demand for railway bridges and material for gas works continues quite steady, especially for Portugal. During the first six months the export of rolling stock for railroads and tramway has doubled, that of machinery has increased 70 %.—*Moniteur des Intérêts Matériels.*

After a series of meetings the Connellsville coke operators have finally decided to advance the price of coke, to take effect on September 1 next. Commencing with that date the price of coke to furnace men will be $1.35 per ton, $1.50 to dealers and $1.65 to foundry men. This increase in the price is the result of the recent strike of the men, whereby they forced the operators to increase their wages.

The first 8-inch tube and jacket received from the Bethlehem Steel Works was successfully assembled at Washington City on Monday in the shrinkage pit of the new gun foundry. From the time the jacket left the furnace until it was secured clamped on the breech of the gun was less than three minutes. Hitherto it has been the custom to purchase all 8-inch tubes and jackets in England. This 8-inch gun, when finished, will be the first of this caliber wholly of American manufacture ever turned out in this country.

The Cape Copper Company and the Societe.

At a meeting of the Cape Copper Mining Company, Limited, E. Pontifex, the president, who is one of the leading men in the metal trade in England, spoke as follows:

That account shows a profit of £93,522, made in the first four months of 1888. This large profit was only rendered possible by reason of the artificially high price which copper reached and maintained during the whole of 1888, owing to the operations of the Société des Métaux, with the general features of which you are all familiar. However disastrous to the Société these operations have proved to be, they have at least enabled us to make a very large amount of profit which otherwise would not have been possible, so that we remain thankful to them for the good they have done us. Had they been more moderate in their views and wiser in their conduct of their operations they might have succeeded in maintaining for some years a fair but not excessive price for copper, and might have emerged with a handsome profit instead of terminating in disaster, but they tried for too much. Theirs was the "vaulting ambition which o'er leaps itself and falls on t'other side." One chief reason why combinations like these ordinarily fail is because any great rise in price checks consumption. But with so necessary an article as copper a moderate rise from a previous abnormally low price, such as existed when the Société first took the matter in hand, should not very appreciably diminish the consumption.

What probably did chiefly cause the collapse was the general distrust which was created by the way in which the Société conducted its operations. They, to use a colloquialism, "choked off" the buyers when they came into the market to buy by unduly raising the price upon them. To maintain any article at a high and especially at an artificial price the confidence of the market is an indispensable requirement. Unless buyers have confidence that the price will be maintained they actually hold off from buying, with the result that stocks accumulate until prices fall by their own weight, and this is actually what happened with the Société. Buyers held off until stocks accumulated to the unprecedented extent of about 180,000 tons, but in the meantime consumers became so bare of stocks that had the Société been able to hold out a little longer it is doubtful whether the buyers could. The result of that attenuation of consumers' stocks is seen in the present condition of the copper market, where we find the price of the metel to be £4 or £5 per ton higher than it was before the Société commenced operations, notwithstanding the depressing effect which must be exercised by the enormous accumulations which remain in the hands of those who financed the Société. For some weeks past the market has been slowly but steadily rising, and this is a much better feature than feverish and spasmodic fluctuations.

Thus the market seems to be righting itself without any of the nursing which has again been proposed by the present representatives of the Comptoir, who, however, appear so far to have been enabled to form a new combination, having for its object a general diminution of output. If such an arrangement could be carried through it would be more legitimate and more likely to be successful than any artificial inflation of price. Price being regulated by the relation which demand bears to supply, the price would, of course, naturally rise if the latter were not in excess of the former, and there can be no more reason why more copper should be raised than is wanted than that more physic should be made up than there are patients to take it. With these views we gave the present representatives of the Comptoir our cordial support in their effort to effect an arrangement of this kind. And Mr. Leaver paid two or three visits to Paris of some duration in order to assist at these deliberations, but nothing has yet come of them. The great difficulty in such an arrangement is to insure that all parties shall keep faith with one another. But it is impossible so to arrange that rogues shall not sometimes get the better of honest men. You will doubtless be desirous to hear something of the present position of the litigation in which we, with the other parties to the contract with the Société, are involved.

Although we have reason to believe that in the statement of its assets and liabilities the Société des Métaux, for obvious reasons, minimized the value of its assets, yet we look mainly to our guarantee from the Comptoir d'Escompte for repayment of the losses to which the Société has subjected us by its breach of contract. The Comptoir d'Escompte pleads, as you may be aware, that the action of their directors in giving us the guarantee was *ultra vires*, and, therefore, that the Comptoir cannot be called upon to pay anything under it. This point had not escaped us when we first commenced to negotiate with the Société, and we took the opinion upon it of the best obtainable French lawyer, and would not enter into the contract until we received satisfactory assurances as to it. And we have since had that opinion abundantly confirmed by other eminent French advocates. We entertain every confidence on this point as well as to our success generally, but as the litigation is now pending you will not expect me to go into further detail at the present moment. We possess one advantage in this litigation—we hold, as a material guarantee, over 3000 tons of copper, representing a value of about £140,000, for which we have been paid, but which we have not delivered. We shall consequently have the advantage of being able to a certain extent to assume a defensive attitude, and it may afford us an opportunity of obtaining some useful and interesting information as to the identity of the powerful members of the syndicate who, it is said, have stood behind the Société des Métaux.

The fall meeting of the American Institute of Mining Engineers will be held at Ottawa, Ontario, on Tuesday, October 1, and the days following. The phosphate mines on the Lievres River, the Sudburg copper mines, the asbestos deposits at Wetford and Coleraine, the Oxford copp mines, the Rockland slate quarries and the Capelton chemical works will be visited.

Mr. Thomas G. Boyle, of the iron brokerage firm of T. G. Boyle & Co., Pittsburgh, accompanied by his mother and sister, left last week for Europe.

Major W. J. Moorhead, of the well-known firm of Moorhead, McCleane & Co., Pittsburgh, is to leave to-day for a short trip to Europe. He expects to be absent about six weeks or two months.

Hon. Whitelaw Reid, United States Minister to France, gave a *déjeuner* to the delegates of Scripp's League of Workingmen. The Lord Mayor of London has invited them to a banquet.

F. L. Higginson was elected a director of the Calumet and Hecla Mining Company, in place of George Higginson, deceased. The board is otherwise unchanged.

Hardware.

There are many indications pointing to an improved condition in business. Reports from different points in the interior and West indicate a gratifying activity, and advices from manufacturers are in most cases satisfactory. The recent improvement in the Iron market is felt to a certain extent in the prices of heavy Hardware, but there are few, if any, quotable changes.

Cut Nails.

The market has been again characterized by some irregularity, due this time chiefly to pressure to sell on the part of an Eastern works. The Western makers are not now pushing into this section as much as they did recently, and it is reported that Wheeling is firmer. A matter which it is thought will relieve the situation in the not distant future is the urgent demand for Soft Steel and for Muck-Bars. Those Nail-makers who have Steel plants ought to be able to do much better in selling their Steel as Billets than in cutting them up as Nails, while the works which still have puddling plants should be able to make money selling Muck-Bar. To a certain extent the same is true in Wire Nails in the case of those who have their Rod mills. At least one large concern has stopped its Wire-Nail factory entirely and is selling its Rods. We quote Cut Nails $1.85 @ $1.90 for carload lots on dock for standard brands and good assortments.

From a well-known jobbing Hardware house of the West we have received the following letter, in which objection is made to the present Cut-Nail card, with the suggestion that it be so arranged that a quotation may be made on a base price without regard to the assortment, as is done with the Wire-Nail card :

As it is now, the manufacturer makes us a price on a sliding scale, and provided we buy enough small Nails the price will be low ; but if we want large Nails we have to pay 5 to 10 cents advance. We, of course, have to buy what our customers want, and we cannot tell them that if they want all large Nails they will cost more than a certain rate ; or, rather, we cannot have a sliding-scale rate for our customers to buy 15 or 20 kegs of Nails on. Should like to see the manufacturers issue a card on the same basis as the Wire-Nail card, so that we or our customers could buy as many large or as many small Nails as we wanted, regardless of anything but the base price, and we will not be happy, as far as the Nail business is concerned, until this is brought about.

Wire Nails.

Manufacturers report a fair business, but the demand is not especially active. The number of different lists in use probably deters business to a certain extent, and the trade are hoping that the manufacturers will be able before long to put an end to the existing confusion by the adoption of a uniform list. Prices remain without change.

Miscellaneous Prices.

Sand and Emery Paper of standard brands is sold quite regularly to the trade at a price ranging from 50 to 50 and 10 per cent. discount, the figures at which the goods are sold by the manufacturers to jobbers justifying this quotation. Paper less favorably known is sold at considerable concessions beyond these figures, so that the market is characterized by a good deal of irregularity.

The market for Meat-Cutters, Sausage-Stuffers and similar goods may be referred to as substantially the same as last year, there being but little change in the manufacturers' prices and few important additions to the line of goods offered. The prospect for business is referred to as promising, and it is expected that the season's trade will be very satisfactory.

Carriage Bolts are in excellent condition, and there is less complaint, and apparently less ground for complaint, in regard to irregularities. While there has been no advance in prices, existing quotations are firm, and a fair business is doing.

Picks and Mattocks are recovering perceptibly from the extremely low prices that have been ruling since the breaking up of the combination, and some of the manufacturers are withdrawing their lowest quotations. It is understood that a great many orders have been booked, and most of the makers have enough to occupy them for some time.

Nothing has been done since our last report which changes the situation of the market in Steel Goods, and the trade are accepting the fact that during the coming year it is to be an open market. The impression, however, prevails that prices will not be materially lower than during the past season, although a slight decline is naturally to be anticipated.

The situation in Wood Goods is also unchanged, but with the failure to reach a satisfactory understanding the impression prevails that during the year this line also will be an open one. Negotiations are, however, still continued, and it may be that an arrangement for control of prices will be reached.

While there is no change in the market for either Manila or Sisal Rope, prices continue weak. Well-informed buyers are placing orders only for their immediate requirements.

We have received from manufacturers of Planes advices in regard to the prices at which the goods are generally sold, with special reference to the paragraph in our last issue in which 70 per cent. discount was named as a price often made by leading Western jobbers. This is alluded to as perhaps unjust to Eastern trade, inasmuch as the goods are frequently sold in this city at discount 70 and 10 per cent. to retailers, and it is intimated that the manufacturers can obtain better prices for the goods in the West than they can in the New York market.

Our attention has been called by the Fred. J. Meyers Mfg. Company, Covington, Ky., to an error in the quotation on their Hunter's Sifters as given our Prices Current. The correct price is $21.60 per gross, instead of $21.00, as printed. The trade will note the correction.

We are advised by the Binghamton Glass Works, Binghamton, N. Y., that the price of their Leader Oil Can is $30 per gross. They refer also to the favor which it is meeting with the trade.

Trade.

From Louisville, Ky., we have under date August 19 the following advices in regard to the condition of business in that market, with especial reference to Hardware and related lines:

The general business of Louisville, Ky., is remarkably good, as is evidenced by the report of the clearing-house, showing a gain of 40 per cent. over the previous week. The Hardware trade, which stands uppermost in the lines of business here, is sharing in the general prosperity. Fine crops contiguous to the city furnish heavy traffic to the railroads, and they, foreseeing the need, have added largely to rolling stocks and made vast improvements to meet the demand. Besides considerable double-tracking of the main lines of roads coming to the city, there has been a great deal of new roads building and extending old ones, especially in the eastern part of the State. This has caused quite a demand for Steel and other contractors' supplies. Close competition among dealers causes such low prices to be made that it reflects back on the manufacturers, who in turn shave among themselves to keep the trade. And, although the demand in general lines is good, it is hard to maintain an advance when one is made, yet sufficient stiffening in prices of certain goods is maintained to furnish a leverage power to the jobbers in selling to the country merchants. Cut Nails are in good demand at recent advance, and the cornering of the Steel-Slab market in the Nail district by several mills will soon have the effect of further advancing prices. Wire Nails are demoralized by the non-uniformity of card price. Bar and Sheet mills are quite firm, with plenty of orders and considerable inquiry. Barb-Wire is still demoralized badly, with no promise of unanimity or advance; the mills seem to be pursuing a cut-throat policy, and yet the demand is good enough to justify higher figures.

Items.

The F. H. Foster Mfg. Company, successors to the Trenton Lock and Hardware Company, Florence, Ala., advise us that they are now in operation and making a full line of Builders' Hardware, the entire plant of the Trenton Lock and Hardware Company having been purchased and removed to the above location. They also call attention to the fact that the old company were in successful operation for 27 years, and allude to the style, quality and price of the goods they are now making. Donald McKay, Jr., who has a wide acquaintance throughout the trade, is connected with the company as traveling salesman for the Southwest, and will take pleasure in presenting their new line of goods to his old friends in the trade. Concerning the company and the advantages of their present location we have the following advices.

We are in splendid shape to do business; have 100 hands of picked men from the oldest establishments in Connecticut; coal and iron at our very door, and are turning out work equal to the best produced in New England. The trade throughout the entire South are giving us good encouragement. We are the first to establish a plant of this kind in the "New South," and we look for a large and prosperous business in the near future.

Standard Axle Mfg. Company, Wheeling, W. Va., have issued a new price-list showing their line of Wagon, Carriage and Buggy Axles, thus illustrating their well-known line of goods. The company have recently added to their works new and improved machinery for the production of these goods, and emphasize the fact that natural gas is used throughout the works. It is stated also that they manufacture in the forge department their own Billets, both Iron and Steel, made from the best selected stock, whereby they are enabled to turn out the grade of Iron and Steel required for their Axles.

From the advertisement on page 76 it will be seen that Pratt & Letchworth, Buffalo, N. Y., illustrate some of their specialties in the line of Snaps, among which are the Ideal, which is made under a recent patent, and the Southern Rope Snap. Attention is also called to the Dixie Back-Band Hook, which was patented last March, and an illustration is given showing its special features.

Ohio Tool Company, Columbus, Ohio, have issued a new price list which relates to Bench and Hand Screws, Plane Irons, Wood Planes, Gauges, Handles, Chisels, Drawing-Knives, Cooper's Tools, Adzes, &c. The catalogue is neatly printed and compactly arranged, illustrations being for the most part dispensed with. Special attention is called to their bevel-edge Firmer Chisels, the quality of which is emphasized.

Henry Seymour Cutlery Company, Holyoke, Mass., have prepared neatly-printed and convenient blotter-pads, which are utilized in calling attention to their manufactures. These blotters contain monthly calendars, and the company state that they will be pleased to send a pad

monthly to such Hardware merchants as request it, and at the same time they will furnish one of their large embossed show-cards calling attention to their Shears and Scissors. One of the pads prepared by the company contains a large number of testimonials in regard to the quality of their goods. We mention this fact inasmuch as many of our readers will perhaps be disposed to avail themselves of the company's offer and at the same time to call attention to the enterprise displayed in the adoption of this method of advertising. It will perhaps be suggestive to manufacturers in other lines who recognize the importance of using such means in bringing their goods to the attention of the trade.

Kentucky Wagon Mfg. Company, Louisville, Ky., announce that they have made a contract with the Parry Mfg. Company, Indianapolis, Ind., by which they accept the general agency of the sale of Road Carts of their manufacture in the Southern States and are now prepared to promptly fill orders for these Carts at factory prices and terms.

Wells & Nellegar Company, Chicago, Ill., have issued a 48-page catalogue of Guns, in which many leading patterns of Arms are illustrated, together with related lines, including Gun Implements, Sportsmen's Supplies, &c. Attention is also called to other seasonable goods.

The Diamond Wrench and Tool Company, Portland, Me., have issued a new catalogue under date August 1, which illustrates their manufactures, including the Diamond Wrenches, Screw-drivers, Hammers, Hatchets, Bit-Braces, Tack-Claws, Can-Openers, Scratch-Awls, Box-Hooks and Link Padlocks. The catalogue is elegantly printed on paper of fine quality and its interesting line of goods is shown off to advantage.

The *Sunday Telegram*, Providence, R. I., August 18, contains an interesting article on Screw-making, with a description of the American Screw Company's works and a history of the company.

Simmons Hardware Company, St. Louis, Mo., are giving prominent attention to the Rochester Lamps, of which they issue an attractive catalogue showing the large variety of patterns of these goods put on the market. They are Western and Southern agents for the sale of the goods.

Hoen & von Kapff, Baltimore, Md., have been appointed agents for the Howe Scale Company and are carrying in their warehouse, No. 7 South Charles street, a full line of Standard Scales, Trucks and Balances. They have also the facilities for the repairing of Scales, &c., at short notice.

A. J. Jordan, St. Louis and Sheffield, manufacturer of fine Cutlery of all descriptions, are now located in their new store, 417 North Broadway, St. Louis, and with their increased facilities are in a position to fill orders with promptness and dispatch.

Hawley Brothers Hardware Company, 305 and 307 Market street, San Francisco, have sold their entire stock of Plows, Cultivators, Harrows and Grain Drills to the Deere Implement Company, who will continue to handle these lines at the above address. Hawley Brothers Hardware Company will, however, keep a full stock of other Agricultural Goods, Wagons, Buggies, &c., in connection with a large and increasing stock of Hardware. They bespeak for the Deere Implement Company a liberal patronage, and give their assurance that the new company will do everything that skill and energy can to serve the Pacific Coast trade with promptness.

The Deere Implement Company also announce this new departure in a circular in which reference is also made to the completeness and superiority of their line of goods, and intimating that the line will be improved in many details and such changes made as experience teaches are required for the difficult soil of the coast. Special attention is called to the new series of John Deere Chilled Plows, which are first shown this season. They are referred to as superior in construction, working qualities and finish, and are fully guaranteed. New Deal Plows and Gangs are also referred to, and it is stated that a Vineyard and Orchard Cultivator will be introduced to meet the requirements of the fruit-raiser. The company are desirous of having an agent in every town of importance and he will be given the exclusive sale in his territory.

Clinton Wire Cloth Company, Clinton, Mass., and New York, issue an illustrated catalogue devoted to Wire Lath, of which a full description is given, with illustrations showing its construction and use. Some interesting illustrations are made of tests applied to the Wire Lath and showing the advantages possessed by it. The catalogue is finely printed and represents this interesting line of goods in an attractive manner.

Trade Topics.

This is a good time, somewhat between seasons as it is, for merchants to ascertain how their sales compare with those of previous years. There are probably many Hardware men who seldom do this and whose methods of keeping track of their business are not such as to enable them to make such a comparison readily, and yet it is unquestionably a matter of considerable importance for a merchant to be thus informed. He should be in a position not only to compare the aggregate of his sales during any given year with those of preceding years, but his methods should be such that he can compare month with month and find whether, on the whole, he is gaining or losing in the volume of trade. It would also be advisable for him to have this information so classified as to indicate the condition of things in each important department of his business, so that if there is a falling off anywhere he may be able to find out in what department the shrinkage occurs. It will then be his business to ascertain the reasons and to find, if possible, a remedy. The aim of the retailer should be to extend his business from year to year, using to this end all legitimate means. An accurate knowledge of the facts is the first essential, and a systematic record of trade will be found, judiciously used, to yield the best results and more than justify the time and labor involved in keeping it.

Concerning the Wire Nail List, and especially the Level List of the Wire Goods Company, Worcester, Mass., which we printed in our last issue, we have the following from a Hardware man in Illinois, who commends emphatically making 10d the base size:

In your issue of the 15th ult. I notice an article headed "A New Wire-Nail Card," and for once we merchants in the retail trade can say "Amen." The Worcester folks have hit the nail on the head. The retail dealer knows that the 10d is the standard, more of them being sold than any other size. Then why not make that the dividing size up to 60s, just as in former years? The whole country is educated up to this card—dealers, mechanics and consumers. Then grade the price the other way, just as the proportion in expense of the manufacture of the different sizes may require. If the present base is not high enough, raise it until it is. The writer makes illustration of what he calls a "Level Card," and I think he is at least level headed, and hope his views may soon be ad opted by the association.

A correspondent thus refers to an improvement that might be made in Grindstones:

There is room for some inventive genius to perfect a Grindstone hanging which should be movable from the stone or frame. I have noticed frequently how inconvenient it is for loafers to sit on the frame while the stone is hanging there. If it could be arranged so that by the shifting of a gear or movement of a lever the stone would drop down out of the way and leave a good seat it would be a benefit to loafing humanity.

Freight Classification.

The Official Trunk Line Classification No. 6, which went into effect August 15, contains a number of changes in the classification of Hardware and related lines which will be regarded with favor by merchants and manufacturers. Apart from several modifications by which more reasonable and equitable rates are given to special goods, it is a matter of more general interest that Hardware N. O. S. is put in third instead of second class, and at the same time the provision in Classification No. 5, by which Hardware in barrels or boxes, valuation not to exceed 5 cents per pound, was put in third class, has been withdrawn as no longer necessary. This classification of Hardware, as we have previously suggested, will be very much to the advantage of the trade, and especially of manufacturers, and will remove a good deal of the objection which has been found with the former classification. In the new classification the following description is given of goods which will be regarded as Hardware:

All articles of iron or steel manufacture when fitted, painted, japanned, bronzed, coppered, acid coppered, plated, tinned, galvanized, or when joined together in the rough, will be considered as Hardware and classified accordingly, unless otherwise specified in the classification.

It will thus be seen that the term Hardware is given quite a wide range and will cover many goods that heretofore have gone as second-class. While this change will thus be a very considerable relief to shippers of Hardware, it will not be the part of wisdom to let the matter rest here. There are still many modifications which should be made in the interests of manufacturers, and it will be well for them to continue to agitate the subject and to bring to bear upon the proper authorities such a presentation of their case as will be likely to result in accomplishing the desired change. What has been gained thus far also illustrates the effectiveness of a discussion on the subject in these columns, a point which is made in the following letter from one of the largest and most widely-known manufacturers in the country:

We have just received a copy of Official Classification No. 6, in which we find Hardware third-class instead of second-class. This will be a great relief to the trade, and we presume it is greatly due to your efforts in our behalf, for which please accept our sincere thanks.

We shall therefore be glad to have advices from manufacturers or other shippers in regard to any injustice which is done them in the present classification, with such facts or arguments as will be likely to have weight in securing a correction of the classification. We will take pleasure in the interest of both the manufacturers and the merchants in publishing

such information, and in other ways bringing arguments to bear upon the classification committees. The success which has attended the efforts in this direction justifies the hope that still further modifications may be secured.

The following letters from representative manufacturers were called out by the article on freight classification which appeared in our issue of August 8. In most of them reference is made to the grievances which are found in the classification given special lines, while in others the importance of the subject is referred to, and also suggestions given as to how the desired result may be attained. They are from manufacturers whose views are deserving of careful attention:

BOARDS OF TRADE.

We are pleased to see the many views of your correspondents on freight classification. But what will it avail the Hardware interests except they are presented by a committee to the gentlemen who have the making and adjusting of freight rates, &c.? The letter of one of the largest File manufacturers covers our case exactly, as we are in the same boat, but believe no special class will be able to obtain a hearing, and, if they should, would likely not accomplish anything. Our idea is that the Hardware Board of Trade in New York, Philadelphia, Boston and Baltimore should discuss the whole matter thoroughly, appoint the chairmen of their freight committees (presume each organization has a freight committee) to meet the commissioners on classification at the proper time and place, and no doubt Hardware will be classed where, in our opinion, it should be—viz., fourth and fifth class. In the meantime a marked copy of *The Iron Age* should be mailed to the proper railroad officials.

UNITED ACTION.

I think it is a matter of very great importance to manufacturers, and consumers alike, but there is such a wide range of articles it seems that instead of special work being done by parties specially interested in a particular line a committee ought to be appointed, both of dealers and manufacturers, to go into the matter thoroughly, and a committee of such a character as to command a careful hearing from the classification committees. The importance of this matter can scarcely be overestimated.

TACKS AND SHOE NAILS.

Noticing the article in *The Iron Age* of the 8th inst. on "Freight Classification," we beg to state that the present classification on Tacks and Shoe Nails to the Pacific Coast averages to amount to nearly 50 per cent. of the home value and on some kinds a little over. This excessive rate compels us Eastern manufacturers to go back to the old conveyance—viz., by vessel around Cape Horn. Shoe Nails and Tacks are packed in kegs or boxes of about 100 pounds each, and are easily handled. They weigh from 80 to 125 pounds to the cubic foot, and should, in our opinion, be so classified as to reduce the present cost of freight at least one-third. The result, in our opinion, would be the same as stated by a landlord whose guests asked him why he watered his rum, to the benefit to both parties.

SHOVELS, SPADES, ETC.

Our goods are shipped at third-class rate in less than carloads; in carloads they go as fifth-class. The Western manufacturers have the advantage over those located in the East. While those in the East may be able to sell their goods as cheap, as regards dollar for dollar, they cannot put the goods into the West as cheap as those manufacturers located in Pittsburgh, St. Louis and other points West, and for this reason the Eastern railroads should look after their interests more and endeavor to give us cheaper freights.

HATCHETS.

We have to complain of what we consider an injustice in classifying Hatchets as second-class, while Axes are in fourth-class. Formerly Axes and Hatchets were both in fourth-class. We think both of the above should be fourth-class in less than carloads; fifth-class in carload lots.

NEED OF DISCUSSION.

We fully appreciate the importance of agitating the freight-classification question, as in many cases the present classifications are unequal, arbitrary and unfair.

HAY KNIVES.

We are deeply interested in the matter of freight classification as to Hardware. We know of no item in the entire list where a modification would be more just than on our manufactured goods—viz., Hay Knives, securely packed one dozen in an iron-bound case, cubic dimension, 50 x 8 x 9 inches and weighing 60 pounds each. We think it will be hard to find goods easier to handle, to pack more easily or nearly as indestructible as ours. We never have heard of a case being broken open or smashed, and although in the different classifications they are not so placed, freight agents in writing B/L take the liberty to insert therin "O. K." We can get no C. L. rate, L. C. L. and C. L. being the same. Eastern classification being third and Western second class, comment is unnecessary, but will do our part in an endeavor to secure lower classification on all Hardware goods.

EDGE TOOLS.

I am very glad to see that your able paper has taken up the discussion of freight classification, and hope the information received from manufacturers as well as merchants may give you such a thorough knowledge of the subject that you may be able to place the matter before the commissioners in the proper shape. The great decline during the past ten years on all goods of my manufacture certainly justifies me in asking for third-class rates. This especially applies to all Edge Tools and handled Hammers. After thoroughly agitating the question of reduction on Sledges, heavy Hammers, Picks, Mattocks, Grub-Hoes, &c., the commissioners placed them in their proper classification.

ENGINES AND THRESHERS.

We have no particular complaints to make of the present Eastern classification on our line of goods, except it be that of an Engine and Thresher, which generally weigh about 13,000 or 14,000 pounds and on which when shipped together we have to pay for the minimum weight, 20,000 pounds, and there is some question about this minimum weight. We notice that some of the roads claim that where an Engine and Thresher are loaded on a car over 30 feet in length the minimum weight will be 24,000 pounds according to rule 3-B of the Eastern classification. The most outrageous classification that we know of, and concerning which we have complained bitterly and have attempted to have corrected, is the present Transcontinental tariff and classification, which, on Agricultural Implements, including Engines and Threshers, makes a rate of $1.25 per 100 pounds from this territory to Pacific Coast points, and on Engines with Saw-Mills $1.95. As you are aware, a great many parties who buy Engines and Threshers for threshing in the season afterward use this same Engine to run a small portable saw-mill during the winter time. A party getting an Engine and Saw-Mill is compelled to pay $140 more freight at the minimum weight of 20,000 pounds than the same engine would cost in freight when shipped with a Thresher. Any one familiar with this class of machinery knows that a Saw-Mill is not as liable to breakage as a Thresher, and this vast difference in rates cannot be attributed to liability to breakage. A Saw-Mill sits well down on the car, where it cannot meet with accidents, while a Thresher stands well up on the car and is much more liable to accident. There is no justice or sense in the difference in rate on machinery of our manufacture, and if you can do anything to have the classification equalized on this class of goods your efforts will not have been in vain and you will have the praise of all of the manufacturers.

SCYTHE AND WHET STONES.

Freight classification is a matter which has given us a great deal of trouble, especially as our goods, Whet-Stones and Scythe-Stones, are sold for so very little money. The majority of Scythe-Stones will not average more than 1½ cents to 2½ cents per pound, while about 144 stones have to be finished to 130 pounds; and usually each stone is labeled or wrapped, from two to five boxes furnished and stenciled, and is delivered on the cars free, with from two to twelve months' time given. This brings the net price very small, and as they are packed in square boxes, easy to handle, and take up very little room for the weight, and as they are not liable to damage either from cold, heat or storms, we think these goods are entitled to the lowest classification given. In 50 years' business we have never made a claim for damages, The majority of our competition is either in Canada or in the Western States, and at both points they can ship the Scythe-Stones with Grindstones in carload lots and get the lowest classification, while we seldom have carload orders. Our orders are usually for Scythe-Stones, from 1000 to 10,000 for one customer. To get carload rates we can combine our orders and ship to one consignee a carload at some of the larger points, but it is much more convenient for us to ship each lot direct to the customer. We have more trouble in the Western classification than in the official, as the official gives Scythe-Stones as third and fifth, and the Western classification gives Scythe-Stones as second, and stones whet, sand, as third, the official classification giving stones sand, whet, as fourth and fifth. Now, what we think ought to be done at least is to make the classification of Scythe-Stones and Whet-Stones the same—less than carloads fourth and carloads fifth, and that to save confusion this classification ought to apply to both official and Western. We lose very much trade on account of the high rates of freight to Western points. The best Scythe-Stones in the world are found in the New England States, and we sell large quantities to Europe on account of being able to ship them at very low rates, much less to Germany than to Kansas; and if it were not for the Canadian Pacific competition, we fear we should be barred out of the Western trade by the high rate of freight that would be charged us. We have laid the matter before the Classification Committee several times, but have been unable to get any favorable consideration, and yet almost everything that is shipped at a less rate of freight is worth from twice to ten times as much per pound as Scythe-Stones and Whet-Stones; and there is not anything that is more needed or is used by a more worthy and industrious class than these goods. As we said before, taking everything into consideration, we think they are entitled to the very lowest classification.

HAMMERS, SHELF HARDWARE, ETC.

We think there are many lines of Hardware which are not unreasonably placed in second-class, but that ordinary Shelf-Hardware, like Nail Hammers, for instance, which are heavy compared with bulk, should be in fourth-class, while goods composed entirely of wire, iron or steel, like Screws, light Wire Goods, Hooks and Staples and the like, should be in sixth-class, all in lots less than carload.

HORSESHOES.

We have no fault to find with our present classification, as our goods go in the special Iron and steel tariff as fifth-class in less than carloads, and sixth-class in carloads of 24,000 pounds. Within a short time the Trunk lines have made an advance by charging for the package the shoes are packed in 6 pounds additional. This they never did before this season, a keg of Horseshoes going the same as Cut Nails as 100 pounds weight.

CARLOAD WEIGHTS.

Freight classification is a very important matter for Eastern manufacturers particu-

larly. The question of competition with Western manufacturers is getting to be one of great importance to Eastern men and the lower the goods are classified the cheaper, of course, they can be laid down on Western ground to compete with goods made there. Then, again, Eastern roads on our goods have one classification and Western roads another, which on a through shipment to, say, Kansas City or beyond makes confusion, for they go at one rate to Chicago and another from there on. Another thing, too, Eastern roads require 24,000 pounds to make a carload and Western only 20,000. That is oftentimes annoying, too. Twenty thousand pounds to the car is enough, particularly where the difference between a carload and less then carload rate is so great. In most cases it is about double for the lesser quantity. We hope with this discussion of this important matter you will be able to do some good and can count on us for any co-operation in our power.

SAND-PAPER.

In regard to the classification of freights on Hardware generally, we are not sufficiently familiar with the same to give an opinion in the matter. The only article connected with the Hardware trade that we handle is Sand-Paper, &c., and on this we are very sure the classification is entirely too high, in view of the bulkiness of the article and its low value when manufactured. We think it should be rated in the fourth-class instead of where it now is.

A BASIS OF VALUE.

We think Hardware should be classed lower than it is, or perhaps what would be better, the rate of freight should be based on the value of the goods. One hundred pounds of one kind of Hardware may be worth only $3.50, while some other kind may cost $30 or $40, and it seems unfair that both should pay the same rate of freight or nearly the same rate. We think that a rate based on the value of the goods would be fair and we cannot conceive of any other grouping classification that will accomplish the purpose as well. Saddlery Hardware is all classed as one class; some of it is worth 6 cents per pound, while some others of the same class will cost 50 cents per pound and both pay same rate of freight.

Arrangement of Stores.

From William Wagner, Washington, D. C., we have a description of the Wire Screen reel shown in Fig. 376. It will be

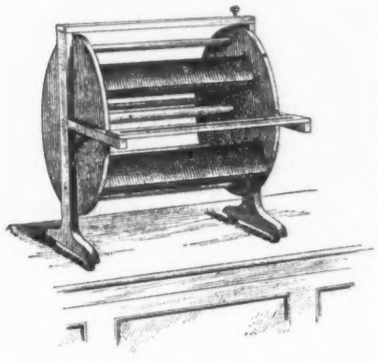


Fig. 376.—Wire-Screen Reel.

perceived that the reel contains spokes, which may be pulled out at one end and stocked with Wire Screen. The reel may contain any number of spokes, the size of the reel being, of course, in proportion to the number of spokes employed. The reel illustrated is 26 inches in diameter and has eight spokes. On the front of the reel is a slotted cutting-board 3 inches wide, the use of which very much facilitates the cutting of the Screen. The reel is revolved until the required size is on a level with the cutting-board, when by dropping the pin, shown at the top, into its proper hole the reel may be secured in that position. The desired length of Wire Screen is then rolled off, the cutting being accomplished by a knife in connection with the slot in the cutting-board. A satisfactory cut is thus obtained, and it is never necessary to handle the whole roll after it is once put on. The reel is mounted on rollers, which permit its removal from place to place. Mr. Wagner refers to the trouble he has encountered in handling this line of goods, but the adoption of the method described has overcome the difficulty, and the disposition of the goods is now pronounced exceedingly satisfactory.

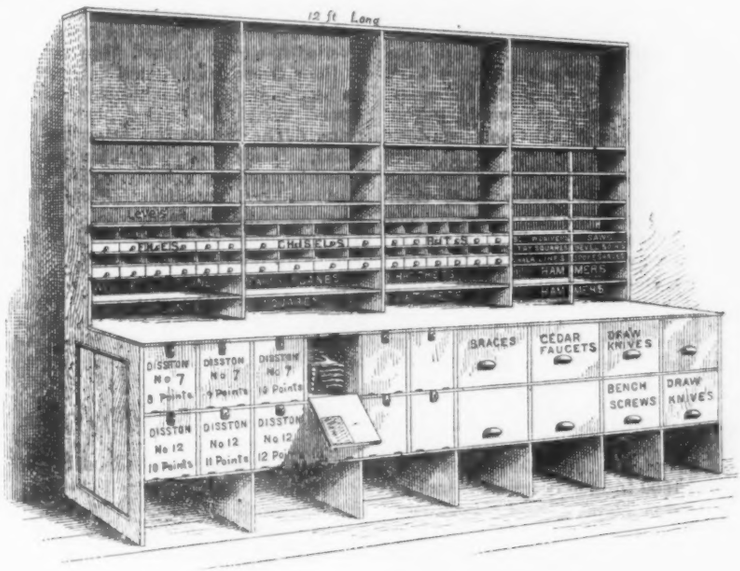


Fig. 377.—Arrangement of Shelving.

We illustrate in Fig. 377 a suggested arrangement of shelving, for which we are indebted to W. H. H. Bonebrake, with the firm of Gittings & Porter, Little Rock, Ark. The section illustrated is intended entirely for Carpenters' and other Tools. The particular use to which most of the drawers and shelves are devoted is indicated in the engraving. The empty spaces above the File-drawers are for stock of same size Files as are in the drawers immediately beneath them, the latter being used to retail from. Similar provision is made for Chisels and Bits. The holes for Saws are just wide enough to take in a Saw and high enough to hold six Saws. They are 32 inches in depth. It is suggested that only one number of Saws should be placed in a box. The covers of the holes are secured by a spring catch and open in the manner shown. The drawers for Braces, Cedar Faucets, Drawing-Knives, &c., should be two or three times as large as the Saw-boxes. In the arrangement of this shelving a space of 2 feet should be left between the section illustrated and the next. Here may be hung up Cross-Cut Saws, Steel Traps, &c. The following section may be used for everything pertaining to Door and Window Hardware, Transoms, etc. The remainder of the shelving should be constructed on the same principle, not overlooking the space of 2 feet between the sections. There will thus be no mixing of goods and competent salesmen will quickly learn the location of every article, as they can at a glance see the section containing Locks, &c., Carpenters' Tools, &c. Westphal's Screw and Bolt Cases are referred to as an excellent method of handling this line of goods. The retail stock of Tacks, Brads, &c., should be kept in drawers, as it is not feasible to make shelf goods of them. These drawers should, of course, be located somewhere in the shelving. The utility of this arrangement is referred to by Mr. Bonebrake, and the point is made that customers will soon know the location of the different goods and will almost invariably be waiting for attention at the right place.

In the disastrous accident on the Knoxville, Cumberland Gap and Louisville Railroad on the 22d inst. W. W. Woodruff, of W. W. Woodruff & Co., of Knoxville, Tenn., was one of the sufferers, having his leg and arm broken. While his injuries are quite severe and painful, yet no fears are entertained as to his complete recovery. He is progressing very favorably, and there is no cause for alarm. Some of the reports that went abroad are said to be exaggerated.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Animal and Vegetable Oils.

The situation in the Oil market has changed very little during the past week. The uncertainties attending the opening of the new season still operate to restrict extensive dealings in Cotton-Seed-Oils, and the condition of the Lard market has a more or less unfavorable effect upon the goods as well as upon purchases of Lard-Oil. There are some indications, however, that Lard has been depressed to a point from which any further material decline in value is improbable, and the impression prevails that, as far at least as the influence of the raw material is concerned, matters will mend during the coming month. The Linseed situation is unchanged, and in other branches there is practically the same condition of affairs that prevailed a week ago.

Linseed-Oil.—Calcutta Seed product, city make, is still quoted at 60¢ for Raw and 63¢ for Boiled, prompt delivery. The "trust" firms claim that they are not offering for future delivery at any less price, but admit that buyers are very back-

ward about placing orders. The latter fact is doubtless in consequence of the relatively lower prices current for "independent" domestic Seed-Oil. Western Raw sells at 57¢ @ 58¢ in small lots and 56¢, it is stated, will yet buy State Oil for delivery a little time ahead. The cheap "outside" brands are meeting with moderately active sale.

Lard-Oil.—Prices for present make prime have weakened about 1¢ ₱ gallon. The best city brands are now offering at 53¢ in ordinary jobbing quantities and sell at 52¢ when round lots are involved, while others that do not enjoy the best sort of reputation go at 51¢. Extra winter is down proportionately, as are also the low grades. In some instances very good sales have been reported at the modified prices, but, taken as a whole, buyers have taken hold in an extremely cautious manner.

Cotton-Seed-Oils.—The "trust" selling agents observe close secrecy as to their operations; buyers are also reticent, and handlers of "independent" Oil the same. In fact, scarcely any information is given, and the volume of business and ruling prices are matters of some uncertainty. Spot goods doubtless move at prices within the range previously quoted. The popular idea of value of new crop, forward delivery, is 35¢ for crude and 40¢ for Summer Yellow in round lots.

Menhaden-Oil.—In crude Oil there has been quite a brisk trade. Home trade buyers have taken fully 2000 barrels and exporters 1000 to 1500 barrels, the bulk of which went at 22¢ @ 23¢ for "good merchantable" quality. The fishing has been very fair and the make of Oil considerable, but the market seems to be kept well in hand. Pressed and Bleached Menhaden and Tanner's Oils are rather firmer.

Sperm and Whale Oils.—The demand for crude products has been very moderate, but the manufactured Oils have had very good sale at steady prices. The stocks of crude in first hands amount to 15,525 barrels Sperm and 1725 barrels Whale.

Olive-Oil.—Italian, in barrels, has been selling in very good lots at 68¢. Foreign advices continue strong, but the goods are still relatively lower here than in the primary market.

Cocoanut-Oil.—Spot goods are very firmly held at 5¼¢ @ 5⅝¢ for Ceylon and about 7¼¢ for Cochin, but the former is obtainable at 5⅜¢ and the latter at 6½¢ for future delivery.

Paints and Colors.

The market for staple goods generally remains in very good shape. There has been a steady demand from both near-by and distant points, and, while operations do not reach remarkably extensive proportions in any particular instance, the general movement compares favorably with the average for this season of the year. Paris-Green manufacturers have been favored with a good Southern demand that makes up in part for the disappointment in the Northern movement during the early season. Corroders report a good, steady movement of Leads, and manufacturers of Zincs, while enjoying merely a fair demand for their goods, begin to look for somewhat higher prices in view of the moderate supply of crude material. Chalk and Whiting seem to be about the only articles on which prices are at all in buyers' favor.

White Lead, &c.—The demand for White Lead and bi-products has been very fair and the market remains steady, with prices and rebates the same as heretofore. The only feature of special interest has been a decision by the "trust" to withdraw the Eastern selling agency of the Eckstien Company. There has been a reorganization of the officials of the company, Mr. Price withdrawing and taking the presidency of the Salem White Lead Company.

Zincs.—The production of American Oxide is on a moderate scale at present, owing to scarcity of crude material, and stocks in first hands are now unusually light, although the demand is merely routine in character. Prices are no higher, but the market is much firmer and an advance on current figures is considered probable ere long. Foreign Zincs are also very firm and in fairly good demand. Prices for foreign Zincs have been advanced, as will be seen by reference to our price-current.

Colors.—The ravages of the cotton-worm have led to a good demand from the South for Paris Green, and a good deal of stock has been moved off that holders had calculated would be carried over to next spring. The association prices are maintained. Quicksilver Vermilion has continued to move in a fairly active way at steady prices. Venetian Red and French Ocher have also met with very good sale. In other Colors there is the average movement, with prices generally steady.

Miscellaneous.—There has been no change of importance in prices for Chalk, Whiting, Paris White, &c., and nothing of special importance in the way of movement of those articles.

Wholesale Prices.

NEW YORK, August 28, 1889.

Animal and Vegetable Oils.

Linseed, City, raw	per gal	60	@	..
" " boiled	"	63	@	..
" Western, raw	"	56	@	58
Lard, City, Extra Winter	"	54	@	55
" " Prime, present make	"	52	@	53
" " Extra No. 1	"	47	@	48
" " No. 1	"	42	@	44
" Western, prime	"	51	@	53
Cotton-seed, Crude, prime	"	35	@	36
" " off grades	"	30	@	33
" Summer Yellow, prime	"	45	@	47
" " " off grades	"	40	@	43
Sperm, Crude	"	61	@	62
" Natural Spring	"	67	@	68
" Bleached Spring	"	72	@	73
" Natural Winter	"	74	@	75
" Bleached Winter	"	80	@	..
Whale, Crude	"	37	@	40
" Natural Winter	"	45	@	46
" Bleached Winter	"	47	@	48
" Extra Bleached	"	49	@	50
Sea Elephant, Bleached Winter	"	54	@	55
Menhaden, Crude, Sound	"	22	@	24
" Crude, Southern	"	22	@	23
" Light Pressed	"	28	@	29
" Bleached Winter	"	34	@	..
" Extra Bleached	"	38	@	39
Tallow, City, prime	"	..	@	50
" Western, prime	"	..	@	49
Cocoanut, Ceylon	"	5½	@	5⅝
" Cochin	"	6¾	@	7¼
Cod, Domestic	"	30	@	32
" Foreign	"	34	@	35
Red Elaine	"	36	@	38
Red Saponified	₱ lb	4¾	@	5
Bank	per gal	26	@	27
Straits	"	27	@	28
Olive, Italian, bbls	"	69	@	70
Neatsfoot, prime	"	62½	@	75
Palm, prime, Lagos	₱ lb	5⅛	@	5⅜

Mineral Oils

Black, 29 gravity, 25 @ 30 cold test,	per gal	8	@	9
" " " 15 "	"	8½	@	9⅝
" " summer	"	6	@	7
Cylinder, light, filtered	"	15	@	20
" dark,	"	14	@	20
" " steam refined	"	10	@	18
Paraffine, 23½ @ 24 gravity	"	11	@	12
" 25 "	"	10	@	11
" 28 "	"	8½	@	9
" red, 21 @ 22 gravity	"	14	@	14½
" " 22½ @ 23 "	"	12	@	13

Paints and Colors.

Barytes, Prime White	₱ ton.	$21.00	@	21.50
" American Refined	"	18.00	@	20.00
" " No. 1	"	16.00	@	17.00
" " No. 2	"	14.00	@	15.00
" " off color	"	12.00	@	.....
Blue, Celestial	₱ lb	5½	@	7½
" Chinese	"	45	@	50
" Prussian	"	20	@	35
" Ultramarine	"	7	@	25
Brown, Spanish	"	½	@	1
" Vandyke, American	"	3	@	3½
" " English	"	6	@	8
Black, American Drop	"	8	@	10
" English "	"	12	@	14
" Frankfort "	"	5	@	18
Black, Lamp, common	"	13	@	18
" " medium	"	19	@	25
" " prime	"	27	@	33
Carmine, No. 40, in bulk	"	3.10	@	..
" " in boxes or barrels	"	3.20	@	..
" " in ounce bottles	"	4.20	@	..
Chalk, in bulk	₱ ton.	2.00	@	2.50
" in bbls	₱ 100 lb	30	@	40
China Clay, English	₱ ton.	13.50	@	18
" Southern	"	10.00	@	11.50
Cobalt Oxide, prep'd	"	2.90	@	..
" " black lots 100 lb	"	2.60	@	..
" " " less	"	2.65	@	..
Crocus Martus, English	₱ lb.	1½	@	2½
" American	"	1½	@	2½
Green, Paris, in bulk	"	20	@	..
" " 170 @ 175 lb kegs	"	20½	@	..
" " small packages	"	22	@	36½
" Chrome, ordinary	"	8	@	11
" " extra	"	12	@	13
" " pure	"	22	@	25

REBATES, &c.—Paris Green.—Rebates to buyers of 500 to 1000 lb during season, ¼¢ ₱ lb; to buyers of 1000 to 2000 lb, 1¢; to buyers of 2000 to 4000 lb, 1¼¢; to buyers of 4000 to 10,000 lb, 2¢, to buyers of 10,000 lb and over 2½¢. Buyers of 5 tons or over at one time receive an additional ¼¢ ₱ lb.

Lead, American White, dry	₱ lb	6¾	@	7
" " in oil	"	7	@	7¼
" " Red	"	6¾	@	7
Litharge, in barrels	"	6¾	@	..
" " 500-lb lots	"	7	@	..
" " smaller "	"	7¼	@	..

REBATES, &c.—White Lead. ½¢ ₱ lb rebate on purchases of 500 lb and over, if paid for within 60 days of date of invoice; terms, 60 days or a discount of 2½ % if payment within 15 days from date of invoice. Extra rebate of ½¢ ₱ lb, payable July 1 and December 31 to buyers of a total of 10 tons pure Lead during the year.

Litharge.—Rebate of ½¢ ₱ lb for cash in 60 days and 2½ % additional for cash in 15 days.

Ocher, Rochelle		1.35	@	1½
" French Washed		1½	@	2½
" German Washed		1¾	@	3
" American		½	@	1¼
Orange Mineral, English		8½	@	9½
" French		9	@	9½
" German		8½	@	9½
" American		8	@	8½
Paris White, English Cliffstone		90	@	1.10
" American		70	@	80
Red, Indian, English		5½	@	7
" " American		2	@	6
" Turkey		9	@	14
" Tuscan		9	@	11
" Venetian, American	₱ 100 lb.	90	@	1.25
" " English		1.00	@	1.45
Sienna, Italian, Burnt and Powd.	₱ lb	5	@	6½
" " burnt Lumps		1½	@	3½
" " Raw, Powdered		5	@	6½
" " " Lumps		2	@	3½
" American, Raw		1½	@	1¾
" " Burnt and Powdered		1½	@	1¾
Talc, French		1¼	@	1½
" American		1	@	1¼
Terra Alba, French	per 100 lb	72½	@	80
" English		80	@	85
" American No. 1		70	@	75
" American No. 2		38	@	40
Umber, Turkey, Bnt. and Powd.	₱ lb	3½	@	4
" Burnt, Lumps		2¾	@	3
" Raw and Powdered		3¾	@	4
" Raw, Lumps		2¼	@	2¾
" Burnt, American		1¾	@	1¾
" Raw, "		1¼	@	1¾
Yellow, Chrome		10	@	25
Vermilion, American, Lead		11½	@	13
" Quicksilver		65	@	70
" English Imported		82	@	85
" Imitation English		8	@	25
" Trieste		75	@	77
" Chinese		88	@	90
Whiting, Common	₱ 100 lb	40	@	45
" Gilders'		55	@	65
Zinc, American, dry	₱ lb	4¼	@	4⅝
" French, Red Seal		7¼	@	7⅜
" " Green Seal		7⅛	@	7⅝
" " V. M. X		6	@	....
" Antwerp, Red Seal		6⅞	@	7
" " Green Seal		7¼	@	....
" German, L. Z. O		5¾	@	....
" V. M. in Poppy Oil, G. Seal, lots of 1 ton and over		9⅝	@	10⅛
lots less than 1 ton		9⅞	@	10⅜
Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over		8½	@	9
Lots of less than 1 ton		8¾	@	9¼

DISCOUNTS.—French Zinc.—Discounts to buyers of 10-bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese	₱ lb	35	@	40
" Prussian		20	@	45
" Ultramarine		12	@	18
Brown, Vandyke		7	@	12
Green, Chrome		8	@	13
" Paris		16	@	18½
Sienna, Raw		7	@	13
" Burnt		7	@	13
Umber, Raw		7	@	10
" Burnt		7	@	10

Glue.

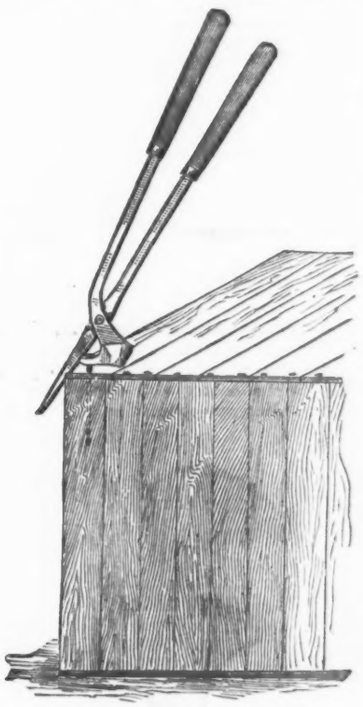
Low Grade	₱ lb	8	@	10
Cabinet		12	@	14
Medium White		13	@	15
Extra "		17	@	20
French		9	@	20
English		10	@	15
Irish		12	@	15

The statement that the late E. S. Higgins, who died worth anywhere from $20,000,000 to $40,000,000, was the son of a Maine farmer; that he grew up in an obscure country town, with no education beyond what the country schools gave a boy in the first quarter of this century, and that he made his way to this immense fortune mainly by his own industry and business sagacity, is one that deserves emphatic mention, the Boston *Herald* remarks, as an instance of self-making which is too significant to be allowed to remain in its place in an obituary notice. Self-making is not uncommon, but in Mr. Higgins' case the higher virtues of life were not overborne by the desire of making money.

The total original cost of the British war-ships of all sorts at the last Spithead review, paraded for the inspection of the Emperor, was £16,853,765. The number of ships present was 73; of torpedo-boats 38. The weight of metal contained in the heavy guns was 8609 tons. The tonnage was approximately 360,000 tons. Five hundred and sixty-nine heavy guns, irrespective of quick-firers and machine guns, composed the armament.

The Hawkins Patent Nail-Puller.

The Hawkins Nail Puller Company, of Terre Haute, Ind., have just brought out a new tool under the above title, which they are introducing to the hardware trade This tool, which is represented in the accompanying cut, is a combination of nail-puller, pipe-wrench, chisel and hammer, the material used in its construction being of the best quality steel (forged). Among the advantages claimed for it are that it is noiseless in its operation; that any size nail can be drawn without splitting the wood; that it will extract nails from barrels as readily as from boxes; that there are no springs to get out of order or become broken, and that it is operated with greater facility than other tools of like character. The principle of its operation is described as follows: The lower jaw is supplied with two prongs, convex in form and ground to a sharp edge on the inner side, and if the tool is pushed forward over the nail head somewhat rapidly with a slight downward pressure the result is that a small shaving is cut from the wood surrounding the

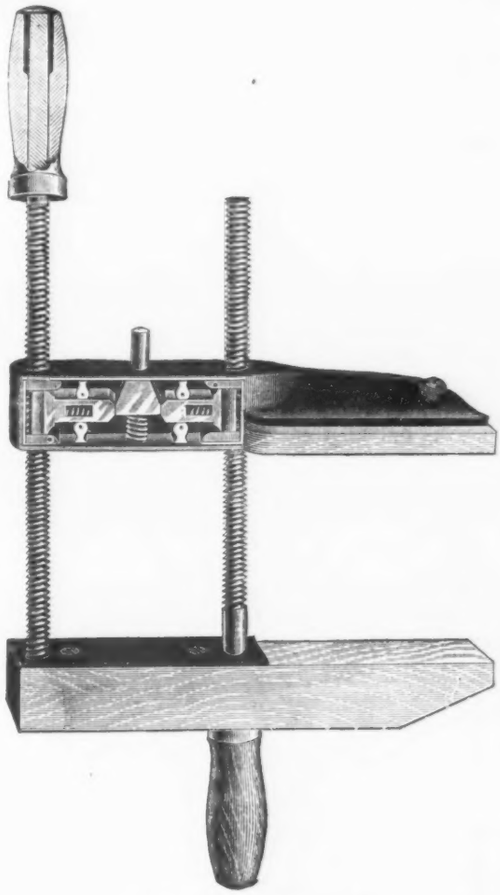


The Hawkins Nail-Puller.

nail head, allowing the prongs of the puller to drop under the head. When a downward pressure is exerted upon the handle of the puller the nail is easily and quickly extracted, the fulcrum being obtained by means of the chisel point shown in the illustration as extending over the edge of the box. The company refer in a circular to numerous testimonials attesting to its merits.

Rapid-Adjusting Hand-Screw.

The Capitol Mfg. Company, of Chicago, Ill., the makers of the hand-screw which we herewith illustrate, aimed to produce a hand-screw that would meet all the requirements as to strength, durability and economy of labor. The upper jaw is made of iron faced with wood where it comes in contact with the material to be clamped, to prevent its being marred. This jaw is very strong and is made partly hollow, and contains the mechanism for adjusting instantaneously the upper to the lower jaw without turning the screws, which are only used for tightening the clamps after they are adjusted. The mechanism is plain and effective and there is nothing to get out of order. The screws are made of wrought-iron and are fastened to the jaws in such a way as to prevent their coming apart, which is a frequent and annoying occurrence with the common hand-screw.

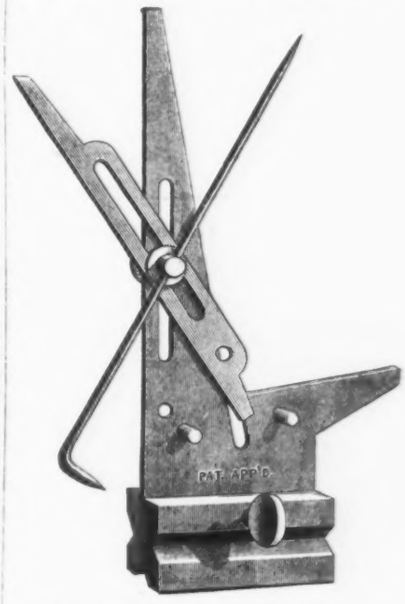


Rapid-Adjusting Hand-Screw.

The lower jaw is made of hard wood thoroughly seasoned and dry, and there is only one smooth hole penetrating the wood, which in no way impairs the strength of the jaw. The construction of the screw is such that a parallel movement of the jaws is assured. These hand-screws are made in all sizes from 6 to 20 inches inclusive. The same firm also manufacture clamps on the same principle, made entirely of iron, for use in machine shops and foundries for clamping molding-flasks together.

New Combination Tool.

This tool is made entirely of steel, and is so designed that it may be put to a great variety of uses. The base-block has in three of its faces a square or V-groove, while in the upper side is a slot in which is fitted the blade, which is held in position by a thumb-screw. The blade is so shaped as to form a square, either inside or outside, as also a hexagon or nut gauge. The upright inclined edge is half way between the two steel pins shown below, and is at right angles to a line joining them, thus forming a center square. This upright blade carries, by means of the slot and thumb-screw, a slotted angle blade and a scribing needle, the needle being employed as a surface gauge or scriber, in which latter case the square groove in the base-block being placed on the shaft or arbor, a circle on any surface at a right or other angle concentric with the shaft can be made. With equal facility it answers as a depth gauge. The slotted angle blade referred to is used in connection with an angle or degree index which the reverse side of the upright blade carries. For this use the angle blade is released from the thumb-screw, and the post shown below is slipped into the hole in the end of this plate. The graduation on the reverse side of the upright blade indicates correctly angles respectively of 80, 45, 60, 90, 120 and 125 or polygon degrees. The manufacturer of this tool, Richard G. G.



Square, Bevel and Surface Gauge.

Moldenke, of 1368 Broadway, New York, names the following uses to which the tool may be put: Straight edge, inside square, outside square, inside centering square, outside centering square, hexagon

gauge, T-square, surface scratch-gauge, circular scratch-gauge, depth-gauge, adjustable dividers, key-seat rule, V-block, universal bevel-gauge and protractor for special angles.

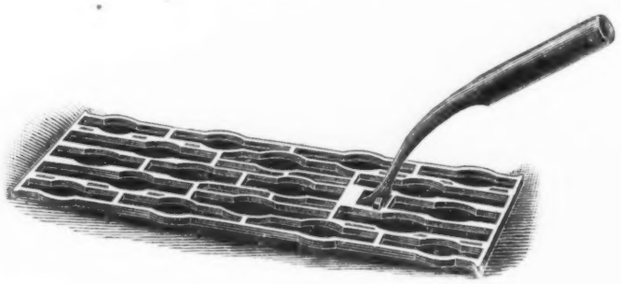


Fig. 1.

Clam-Roaster.

It is peculiarly appropriate at this time of the year to call attention to any device by the aid of which the full flavor of the roast clam can be preserved. A device which is intended to do this and at the same time eliminate the dirt factor, which is much too prominent in the roast as usually served, has recently been put on the market. One of the grates here illustrated, Fig. 1, is intended for small-size or little-neck clams. In use it is placed inside the larger grate, Fig. 2, which is intended for medium-size clams. The edge or mouth of the clam is placed downward in the grate pockets, as shown in Fig. 2. This wedges the two parts of the shell closely together so as to retain the juice and also prevent the entrance of dirt and ashes. For home use the grates are placed down on the coals, an ordinary stove-lifter being used. The clams can be placed on the table while in the grate, which will keep them hot. These roasters are made by Fowler & Keene, of 194 Front street, New York.

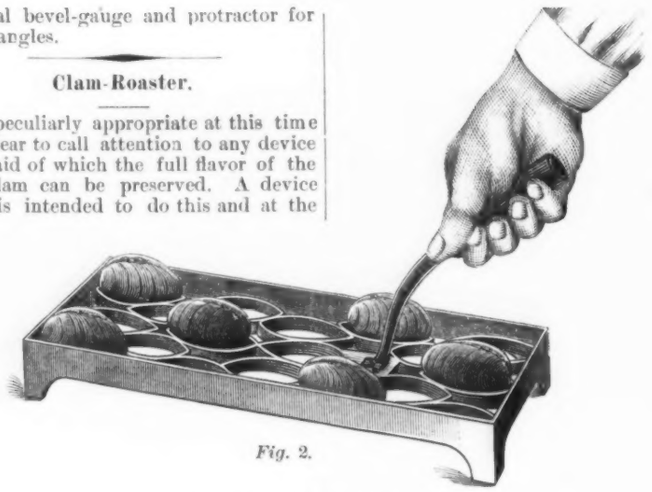
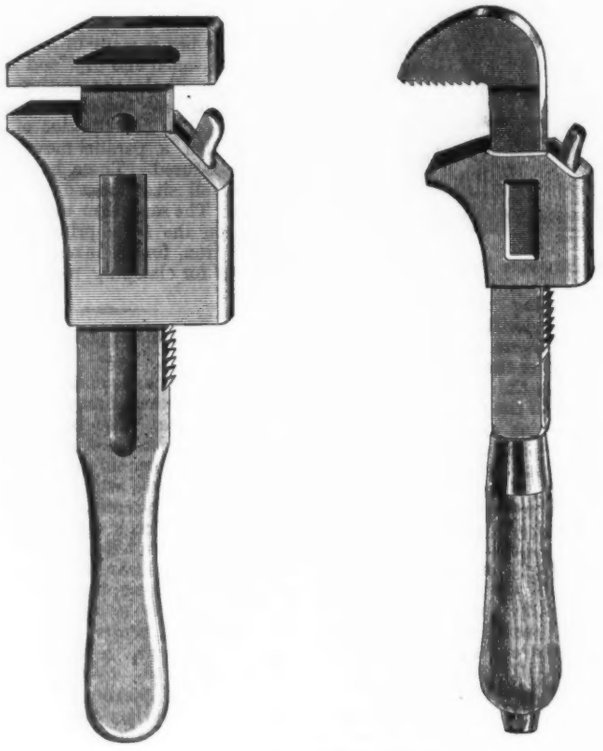


Fig. 2.

The Universal Clam-Roaster.

Ratchet Pipe and Nut Wrench.

Biel & Urban, of Terre Haute, Ind., are inviting the attention of the trade to a new form of wrench, of which we present illustrations. Reference to the engravings will show the ratchet plate dovetailed into the stock of the wrench. This plate is made of case-hardened steel. A ratchet dog-housed in the sliding jaw is forced downward on to this ratchet plate by a pressure spring resting upon its upper side. To set the wrench at any desired point pressure upon the dog with the thumb or forefinger releases it from the plate, instantly permitting the sliding jaw to be set where required or up to the object. The ratchets in the plate are cut from $\frac{1}{32}$ to $\frac{1}{4}$ inch, according to size, when fitted to the nut-wrench. In the pipe-wrench but three sizes of ratchet are used. The entire tool with the exception of the handle (into which the stock enters the entire length) and the sliding jaw is made of steel, drop forged. The latter to insure greater strength or toughness is made of malleable iron. Among the advantages claimed for the pipe-wrench is that its construction is such as to obviate all liability of sticking when removing from pipe, readiness with which it can be adjusted and the greater the pressure the tighter the grip. The manufacturers state that should the ratchet plate referred to ever break or wear out it can at a trifling cost be easily replaced by the owner.



Ratchet Pipe and Nut Wrench.

Galvanized-Iron Cistern.

In the accompanying illustration we present a general view of a form of galvanized-iron cistern which has lately been brought out by Harry Brothers, of Dallas, Texas. These cisterns are made of corrugated iron, and are warranted to endure for 25 years. They are furnished with closed top and charcoal filter, are claimed to be light and easily transported, and have been thoroughly tested. They are made in any size from 1 to 1000 barrels in capacity. These cis-

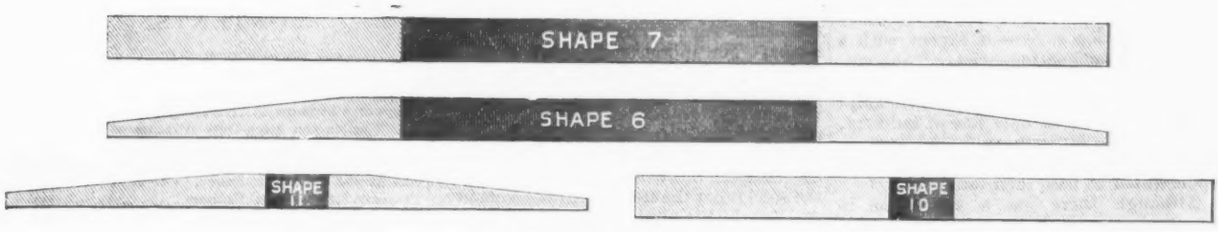
Galvanized Iron-Cistern.

terns are claimed to possess may advantages over those made of wood, as there are no hoops to come off, no staves to spread and no wood to decay.

Emery-Wheels.

Emery bricks have come into use for a vast number of special and general purposes, and as a natural result they are now made in a great variety of shapes, grades and sizes. The drawings here presented show special forms of emery-wheels made by the Norton Emery Wheel Company, of Worcester, Mass., for the Brown & Sharpe grinding machinery, and which have proved very successful. The table gives the size of the several shapes:

For No. 1 Universal Grinder.



For No. 2 Universal Grinder.

For Tool Grinder.

For Universal Cutter and Reamer Grinder.

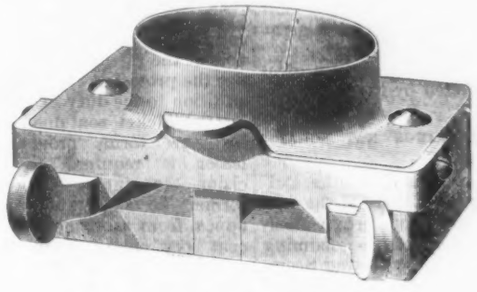
For Inside Grinding.

Special Forms of Emery-Wheels.

Shape.	Diameter.	Thickness.	Size of hole.	Shape.	Diameter.	Thickness.	Size of hole.
29	7	1/2	3	35	4 1/2	3/8	3/4
33	7	1/2	3	18	2 3/8	3/8	3/4
7	12	1/2	5	19	2	3/8	3/4
6	12	1/2	5	20	1 1/2	1/4	1/4
11	7	3/8	3/4	21	1 1/4	1/4	1/4
10	7	1/2	3/4	22	1	1/4	1/4
15	6	3/8	3/4	23	7/8	1/4	1/4
32	7	1/4	3/4	24	3/4	1/4	1/4
26	6	1/4	3/4	25	5/8	1/4	1/4

Elevator Stop and Lock.

The "S. and B." elevator stop and lock is a simple device intended for automatically stopping and holding an elevator on a level with any floor in a building until released by the person using the same. The lock is designed particularly for freight elevators and is attached either to a bracket or standard. The cut shows the lock open and free to pass up or down the check-rope. To lock, the drop-latch is lifted with the finger, when the locking-jaws fly together. To unlock, pull either of the locking-jaws from the center to the side, which forces them into the position shown, the drop-latch falling of its own weight and holding the jaws open. At each floor two stops are attached to the check-rope which passes through the lock. In going up or down the tapering end of the first stop forces the jaws apart sufficiently to allow it to pass through, and they then engage with the square end of the second stop, and move the check-rope sufficiently to bring the hoisting machinery to a stop. The lock is made entirely of steel, has few parts and is very simple in its operation. The selling price is also much lower than that of any other lock. This patent is owned by F. W. Lowe, 83 Wendell street, Boston, who is also the manufacturer.



Automatic Elevator Floor-Stop and Lock.

A very interesting German pamphlet giving a short history of Krupp's establishments at Essen has just been published. From this we learn that the finest ordnance works in the world were started in 1833 with a staff of nine workmen. They now employ 20,960 men, while, including the families of the workmen, the total number dependent on the factory is 73,769. There are 1195 furnaces of various constructions, 286 boilers, 92 steam hammers, 370 steam engines developing 27,000 horse-power, and 1724 machines of different kinds. The total consumption of coal and coke is 2735 tons daily, and 11 blast-furnaces yield 600 tons of iron daily.

The high charges for natural gas consumed in Pittsburgh stimulate the construction of independent pipe lines by the principal manufacturers. The example of Andrew Carnegie in announcing the intention of building a line from the new Belle Vernon fields in Fayette County, to supply the Edgar Thomson Steel Works, at Braddock, is followed by Jones & Laughlin, who will build a line 18 miles long to supply the firm's American Iron Works on the South Side. Each line will cost $250,000.

Washington News.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., August 27, 1889.

The two formal bids by the Cramps and the Bath Company, the withdrawal of the bid of the Union Iron Works, of San Francisco, and the presence of representatives of ship-building firms who declined to bid on the 2000 and 3000 ton steel cruisers will draw the line on Congress in the matter of legislative limitation as to cost of building vessels of war.

It will either be necessary for Congress to follow the advice of naval experts who can form an approximate idea of the cost of vessels or else the Government will be compelled to find some other means of building war-ships for the arbitrary sums fixed. The risks taken by the builders are admitted to be too great to undertake the construction of vessels except with a fair margin for contingencies. The experience of the past three years has demonstrated practically what American shipbuilders can do in this line of industry, and the prices hitherto paid and cost to builders has given them a practical basis upon which to base their estimates.

Although there was a suggestion in naval circles to build the unawarded cruisers in the Government yards, the officers were evidently not willing to undertake the job within the limits of the appropriations. Upon the strength of this, new advertisements for bids for the 2000-ton cruisers have been published, making certain modifications as to extension of time six months, reduction of maximum speed 1 knot, making it 17, and regulation of premiums. The builders will also have about two months in which to consider the matter. If they still hold off no other recourse can be had but to ask Congress to increase the limit. It is not improbable that the 3000-ton cruisers will be readvertised.

There is a disposition on the part of bidders to make an effort to bring their figures within the limit by a recalculation of cost. The modifications giving them more time will admit of some economy of labor and less speed, and opportunity to make up a certain margin on premiums for over maximum speed required will be an encouragement. This hitch is regarded as very unfortunate, as it only retards the necessary work of rebuilding the navy and checks the demand for steel required for continued activity on Government work. The approaching Congress will undoubtedly act more liberally in the matter of appropriations for building vessels of war. The Secretary of the Navy is now engaged in formulating the data upon which he will make a report upon a systematic plan of naval construction and armaments, all of which will create a great demand for steel and iron.

The following decisions in metallurgical cases have been rendered by the Secretary of the Treasury:

BOILER-PLATE SHEARINGS NOT SCRAP-STEEL.

In reversing the assessment by the Collector at Philadelphia of duty at the rate of $\frac{3}{10}$ of 1 cent per pound on certain steel-plate shearings, the appellants claiming the rate of 45 per cent., the Acting Secretary of the Treasury says: "It appears from the statement of the appellants and the special report of the United States Appraiser that the merchandise in question consists of new pieces of steel cut from boiler-plates in the process of manufacturing boiler-plates at the rolling-mills, so that applying the principle enunciated in decision of April 29, 1889, which was based upon a ruling of the United States Supreme Court, the same had not been in actual use, and, consequently, was not scrap-steel within the meaning of the provision, which prescribes that 'nothing shall be deemed scrap . . . steel except waste or refuse . . . steel that has been in actual use and is fit only to be remanufactured.' The appeal is therefore well taken, and you are hereby authorized to reliquidate the entry by classifying the merchandise as 'steel not specially enumerated or provided for' at a duty of 45 per cent. ad valorem."

STEEL IN STRIPS.

On an application for a reconsideration of a Department decision on an appeal from a decision sustaining an assessment of duty at the rate of 45 per cent. ad valorem on certain steel in strips, or hoop steel, imported by them, the importers claim that the statement of the appraiser, that the steel in question is made from wire or wire-rods rolled flat, is incorrect, and that it is in fact rolled direct from the billet in the same way as any other flat strips or hoops. The appraiser, in his report of the 11th inst., states that while the steel has the appearance by its rounded edges of having been rolled flat from wire-rods, it may have been produced by having been rolled direct from billets in grooved rollers. He renews, however, his statement that the steel is not the steel strips of commerce. As this is the vital question in the case, the Department sees no good reason for modifying its decision, and the application is therefore denied.

DUTY ON BREECH-LOADING SHOT-GUNS.

On an appeal from 35 per cent. ad valorem duty on certain Belgian rifles the appellants claimed that the "arms were originally army muskets, breech-loading, and having been changed only by removing the bayonets and a portion of the wooden stocks, and cleaned and repaired, but not changed in their original caliber or mechanism," they should be assessed at 25 per cent. ad valorem for "muskets, rifles, and other fire-arms." As breech-loading shot-guns are specially provided for the assessment of duty at the rate of 35 per cent. ad valorem is approved.

DUTY ON COPPER IN NICKEL MATTE.

In response to a letter of inquiry in regard to the proper rate of duty on copper contained in so-called nickel matte the Department says: "In a former decision it was held, on the basis of the facts then represented, that such matte was dutiable at the rate of 2½ cents per pound for each pound of fine copper contained therein, under the provision for 'copper imported in the form of ores;' but in view of the statement that matte is not an ore the question was further investigated and it was ascertained that matte and regulus of copper are synonymous terms. The Department therefore decided that the fine copper contained in nickel matte is dutiable at the rate of 3½ cents per pound, under the provision for regulus of copper, in addition to the duty of 15 cents per pound on the nickel contained therein imposed by the tariff provisions. The collector is required to apply this decision to future importations." The former decision was rendered on an appeal from assessment of duty at 2½ per cent. per pound upon the copper contained in the nickel matte. The appellants claimed that as the article was nickel matte, and as duty was imposed upon the nickel contained therein, the copper should be passed free of duty. It appeared from the report that the merchandise in question was duly analyzed and found to contain both nickel and copper, and that thereupon duty at the rate of 15 cents per pound was imposed on the nickel under the provision for "nickel in ore, matte, or other crude form not ready for consumption in the arts, 15 cents per pound on the nickel contained therein," and at the rate of 2½ cents per pound on the copper under the further provisions in said schedule for "copper, imported in the form of ores, 2½ cents on each pound of fine copper contained therein." As the decision seemed to be strictly in accordance with the statute, the same was affirmed.

JAPANNED WARE.

Certain "japanned ware" having been assessed at 45 per cent. ad valorem duty, and an appeal having been made claiming 40 per cent. ad valorem as manufactures of metal not specially provided for, the Department rejecting the appeal ruled that the articles in question consisted of candlesticks and other articles of metal which had not undergone a process of japanning, but were merely painted.

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CURRENT HARDWARE PRICES.

AUGUST 28, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.—

Caps, Percussion, ℔ 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....16@18¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges.

Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting.....15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges .22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—

First quality, 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Star, Club, Rival and Climax brands.....20&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.....65&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25

Shells Loaded—

Standard. List.....40&10@40&10&10%

Wads—

U. M. C. & W. R. A.—B. E., 11 up..$2.00
U. M. C. & W. R. A.—B. E., 9&10.. 2.30
U. M. C. & W. R. A.—B. E., 7&8.. 2.60
U. M. C. & W. R. A.—P. E., 11 up.. 3.10
U. M. C. & W. R. A.—P. E., 9&10.. 4.00
U. M. C. & W. R. A.—P. E., 7&8... 4.90
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20..... 2.80

20&2%

Anvils.—

Eagle Anvils, ℔ 10¢..... ...20@20&5%
Peter Wright's.....9½¢@9¾¢
Armitage's Mouse Hole.....8¾¢
Armitage's Mouse Hole, Extra.11¼@11½¢
Trenton.....9¼@9½¢
Wilkinson's.....9½@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%

Apple Parers—

Advance.....℔ doz $4.75
Antrim Combination.....℔ doz 5.50
Baldwin.....℔ doz 5.25
Champion.....℔ doz 7.25
Daisy.....℔ doz 4.00
Eureka, 1888.....each 17.00
Family Bay State.....℔ doz 12.00
Favorite.....℔ doz 5.00
Gem.....℔ doz 5.25
Gold Medal.....℔ doz 4.00
Ideal.....℔ doz 4.00
Improved Bay State.....℔ doz 30.00
Little Star.....℔ doz 4.50
Monarch.....℔ doz 13.50
New Lightning.....℔ doz 5.50
Oriole.....℔ doz 4.00
Penn.....℔ doz 4.00
Perfection.....℔ doz 4.00
Pomona.....℔ doz 4.00
Rocking Table.....℔ doz 6 00
Turntable.....℔ doz 4.50
Victor.....℔doz 13.50
Waverly.....℔ doz 4.00
White Mountain.....℔ doz 4.50
72.....℔ doz 4.25
76.....℔ doz 5.75
78.....℔ doz. 6.50

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher, Rockford Bit Company.
Cook's, Douglass Mfg. Co. 70%
Cook's, N. H. Copper Co.....55 %
Ives' Circular Lip.....50&10@50&10&5%
Patent Solid Head.....60%
C. E. Jenning & Co., No. 10, extension lip.....30%
C. E. Jennings & Co., No. 30.....40%
C. E. Jennings & Co., Auger Bits, ℔ set, 32½ quarters, No. 5, $5; No. 30, $3.50.....20%
Lewis' Patent Single Twist.....45%
Jennings' Augers and Bits.....45%
Imitation Jennings' Bits.....25%
Pugh's Black.....60&60&5%
Rockford, Jenning's Pattern.....20%
Car Bits.....60%
L Hommodieu Car Bits.....50&10@60%
Forstner Pat. Auge Bits.....15&10%

Hollow Augers—

Ives'.....
French, Swift & Co.....
Douglass'.....
Bonney's Adjustable, ℔ doz $48.....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%

33⅓ @ 33⅓&10%

Expansive Bits—

Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ℔ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....℔ gross $2.75@$3.25
Diamond.....℔ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co.....30&10%
Double Cut, Hartwell's, ℔ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood...40&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ℔ gr, $3.50.....45&10%
Pat. Sewing, Short.$1.00 ℔ doz.....40&10%
Pat. Sewing, Long.....℔ doz $1.20
Pat. Peg, Plain Top.℔ gr $10.00...45&10%
Pat. Peg, Leather Top.℔ gr $12.00.45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ℔ gr $1.70, 35%
Awls, Should. Peg. ℔ gr $2.45, 40@40&10%
Awls, Pat. Pegs...℔ gr $3¢ ..40@40&10%
Awls, Shouldered Brad..2.70 ℔ gr....35%
Awls, Handled Brad...$7.50 ℔ gr....45%
Awls, Handled Scratch ℔ gr, $7.50.35&10%
Awls, Socket Scratch. ℔ doz, $1.50.25@30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ℔ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls.. Nos. 1, $12. 2, $18.....25%
Henry's Combination Haft...℔ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Axes—

Makers' and Special Brands—

First quality.....℔ doz $6.00@$6.50
Others.....℔ doz $5.50@$5.75

Axle Grease—

Fraser's.....Keg ℔ ℔ 4¢, Pail ℔ ℔ 5¢
Fraser's, in boxes.....℔ gr $0.50
Dixon's Everlasting, in bxs...℔ doz 1℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 85¢
Lower grades, special brands, ℔ gr $5.50@$7.00

Axles—†

No. 1.....4¢@4¼¢, No. 2 5¼¢@5½¢
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—

Sprengle's Pat.....℔ doz $18.....60%

Balances—

Spring Balances.....50%
Common 24-℔.....℔ doz $1.50.....50%
Chatillon's Spring Balances.....50%
Chatillon's Circular Spring Balances.60%

Bells—

Hand—

Light Brass..70&10 @ 75%
Extra Heavy.....60&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent).....25&10@35%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10&5%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Cow—

Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70&70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....℔ ℔ 3¢@3¼¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60@60&5%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60&10&5%
N. Y. B. & P. Co., Diamond.....50&10%

Bench Stops—

Morrill's.....℔ doz $9, 50%
Hotchkiss's.....℔ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's.....℔ doz $3.....10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

Blind Adjusters—

Domestic.....℔ doz $3.00, 33⅓%
Excelsior.....℔ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Blind Fasteners—

Mackrell's, ℔ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ℔ gr..60&10%
Van Sand's Old Pat., $15.00 ℔ gr..55&10%
Washburn's Old Pattern, ℔ gr.....$0.00
Merriman's.....new list
Austin & Eddy No. 2008, ℔ gr.....$9.00
Security Gravity, ℔ gr.....$9.00

Blind Staples—

Barbed, ½ in. and larger.....℔ ℔ 7½¢@8¢
Barbed, ⅝ in.....℔ ℔ 8½¢@9¢

Blocks—

Ordinary Tackle, list May 20, 1889...50%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list...55&10%
Wr't Sunk Flush, Stanley's list...50&10%
Wr't B.K.Flush, Com'n " ...55&10%

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, according to size.....80@80&5%
Bolt Ends, according to size...80@80&5%

Tire—

Common, list Feb. 28, '83.....70%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....70%
Phila., list Oct. '84.....82½%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84 ...75&10%
American Screw Company:
Norway, Phil., list Oct. 16, '84....75&10%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....82½%
Bay State, list Feb. 28, '83.....70%
R.B.&W., Philadel., list Oct. 16, '84...82½%

Stove and Plow—

Stove.....65%
Plow.....60&5%
R. B. & W., Plow.....55%

Borax.....℔ ℔ 9½@10½¢

Boring Machines—

	Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75		50%
Snell's, Rice's Pat.	5.50	6.75	40&10&10	
Jennings	5.50	6.75	45@45&10	
Other Machines	2.35	2.75		net
Phillips' Patent with Augers	00	7.50		

Bow Pins—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W. Co. 50&10@50&10&5%

Braces.—

Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Osgood's Ratchet.....40&10@50%
Spofford's.....50&5&50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60@5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5&60&10%
Common Ball, American.....$1.00@$1.10
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 ;10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
P. S. & W.....50&10%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods.....87½

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x11
} Per doz...$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....55%
Sargent's.....66⅔&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70%
Peck, Stow & W. Co's..50&10@50&10&10%
Eilrich Hdw. Co., White Metal, low list. 50@50&10%

Butcher's Cleavers—

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Butts—

Brass—

Wrought Brass.....75@75&10%
Cast Brass, Tiebout's'.....33⅓%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60&5%
Fast Joint, Broad.....55&10&5@60&10%
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns..
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips
.....70&10 @75%

Wrought Steel—

Fast Joint, Narrow.
Fast Joint, Lt. Narrow.
Fast Joint, Broad.
Loose Joint, Broad.
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.
Inside Blind, Light.
Loose Pin.
.....70&10 @75%
Bronzed Wrought Butts.....50%

Calipers—

See Compasses.

Calks, Toe—

Gautier.....℔ ℔ 5½¢@6¢
Dewicks (Burke).....℔ ℔ 5½¢@6¢

Can Openers—

Messenger's Comet.....℔ doz $3.00, 25%
American.....℔ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....℔ doz $3.75, 20%
No. 4 French.....℔ doz $2.25, 55@60%
No. 5, Iron Handle.....℔ gr $6.00, 45@50%
Eureka.....℔ doz $2.50, 10%
Sardine Scissors.....℔ doz $2.75@3.00
Star.....℔ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50 50&10&10%
World's Best, ℔ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ℔ doz $3.00.....35&5%
Domestic, ℔ doz $2.50.....45%
Champion ℔ doz $2.00.....50

Cards—
Horse & Curry.....10&10@10&10&10%
Cotton.....10@10&10%
Wool.....10@10&10%

Carpet Stretchers—
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.₱ doz $19.00
Bissell, Grand.....₱ doz $26.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen, Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
arlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2.....₱ doz $16.00
American.....₱ doz $15.00
Grand Republic.....₱ doz $35.00

Cartridges—
See Ammunition.

Casters—
Bed.....
Plate.....} Brass....55@55&10%
Shallow Socket.....} Others...60@60&10%
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6½-10-2, exact, ₱ pair, $1.03.....50&10@50&10&5%
Trace, 6½-10-3, exact, ₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact, ₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884.....50&10@50&10&5%
American Coil, in cask lots,
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
$8.25 5.75 5.00 4.00 3.70 3.60 3.50 3.40
Less than cask lots, add ½¢@¾¢ ₱ ℔.
German Coil, list of June 20, 1887.....50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60@2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5½@6¢
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70@70&5%

Chalk—
White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....
New Haven.....
Witherby.....} 75&10 @ 75& 10&5%
Mix.....
Ohio Tool Co.....
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60@10@60@10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to £
Buck Bros.....30%
Cold Chisels, ₱ ℔.....16@19¢

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Balz Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Gray's.....20%
Adjustable, Lambert's.....20%
Adjustable, Snow's.....40&5%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises

Clips—
Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....66⅔&5@70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₱ ℔, 5½¢
Steel Felloe Clips.....₱ ℔, 5¢
Baker Axle Clips.....25%

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2%

Coffee Mills—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20&10%

Compasses Dividers, &c—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%

Corkscrews—
Humason & Beckley Mfg. Co..40@40&10%
Clough's Pat.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Corn Knives and Cutters—
Bradley's.....10%
Wadsworth's.....25%

Cradles—
Grain.....50&2%

Crayons.
White Crayons, ₱ gr 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—
Cast Steel.....₱ ℔ 4¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubber per doz $10.00.....20%
Perfect.....50%

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to £

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10@50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60@10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75..
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50...55&10%
Hercules.....50%
Shaw Door Check and Spring.25@30@35%

Drawing Knives—
Witherby.....
P. S. & W.....} 75&10 @ 75&10
Mix.....} &5%
New Haven.....
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50.20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools...$1.75@$1.85

Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits,—See Augers and Bits.

Drill Chucks,—See Chucks.

Dripping Pans—
Smallsizes.....₱ ℔ 6½¢
Large sizes.....₱ ℔ 6¼¢

Egg Beaters.
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ gro $15.00
Rival (Standard Co.).....₱ gro $12.00
Large Duplex (Standard Co.), ₱ doz $4.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery— No. 4 to 46 gr. | No. 54 to 150 gr. | Flour, CF FF.
Kegs, ₱ ℔.....4½¢ | 5 ¢ | 2½¢
½ kegs, ₱ ℔...4¾¢ | 5½¢ | 2¾¢
¼ kegs, ₱ ℔...5 ¢ | 5½¢ | 3 ¢
10-℔ cans, in case.....6 ¢ | 6½¢ | 5 ¢
10-℔ cans, less than 10.....10 ¢ | 10 ¢ | 7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25&10%

Felloe Plates.....₱ ℔ 6@6½¢

Fifth Wheels.—
Derby and Cincinnati.....45&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands 60&10@60&10&10%
Fair brands.....60&10&10@70%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60&10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
J. & Riley Carr....List, April 1, 1883, 15%
J. & Riley Carr Horse Rasps.....10%
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps. American list, 6%

Fluting Machines—
Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-Inch Rolls.....$3.60 each }
Eagle, 3¼-inch Roll, $2.15.....35%
Eagle, 5¼-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors—.....45%

Fodder Squeezers—
Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Forks—
Hay, Manure, &c., Asso. List.....65%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—
Buffalo Champion.....65&65&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, each, $1.50.....25%

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20&10&30%
Henis.....₱ doz $2.50
Shepard's Queen City.....40%

Fry Pans—
High List.....75&5@75&10
No..... 0 1 2 3 4
₱ doz..$3.75 $4.70 $5.30 $5.95 $6.55
No..... 5 6 7 8
₱ doz.....$7.50 $8.75 $10.00 $11.25
Low List.....65&10%
No..... 0 1 2 3 4
₱ doz..$3.00 $3.75 $4.25 $4.75 $5.25
No..... 5 6 7 8
₱ doz.....$6.00 $7.00 $8.00 $9.00

Fuse— ₱ 1000 ft
Common Hemp Fuse, for dry ground.$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr.. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gauges—
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch.....25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50&50&5%
Wire, Brown & Sharpe's.....10&20%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process.....25@25&5%

Glue Pots—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—
Small, at factory.....₱ ton $7.50@9.00

Grindstone Fixtures—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—
See Saws.

Halters—
Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie.....50&2%
Covert's Jute Horse and Cattle Ties.....60&10&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85..
Buffalo Hammer Co.....} List Jan. 15, '87
Humason & Beckley.....} 50@60&10%
Atha Tool Co.....}
Fayette R. Plumb.....40&10@50%
C. Hammond & Son.....40&10@50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under.....₱ ℔ 40¢ } 60&10
3 to 5 ℔.....₱ ℔ 36¢ } &10 @ 70%
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢ ₱ ℔

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....2 5

Handles—
Iron, Wrought or Cast—
Door or Thumb.
Nos..... 0 1 2 3 4
Per doz....$0.90 1.00 1.18 1.35 1.50
60&10&10%
Roggin's Latches.....₱ doz 30¢@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%
Handles, Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd..₱ gr 4.50 } ₱ doz
Hickory Firmer Chisel, large..₱ gr 5.00 }
Apple Firmer Chisel, ass'd...₱ gr 5.00 } ₱ gr
Apple Firmer Chisel, large...₱ gr 6.00 }
Socket Firmer Chisel, ass'd...₱ gr 3.00 } ₱ doz
Socket Framing Chisel, ass'd..₱ gr 5.00 }
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr 2.75 }
Auger, assorted.....₱ gr 5.00 } 40@
Auger, large.....₱ gr 7.00 } 40&10%
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan's.....₱ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢... 60%
Champion ..... 15¢

Hangers—
Barn Door, old patterns...60&10&10@70%
Barn Door, New England..60&10&10@70%
Samson Steel Anti-Friction 55%
Orleans Steel 55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track 65%
Champion ..... 60&10%
Rider and Wooster, Medina Mfg. Co.'s list 70%
Climax Anti-Friction 60%
Climax Anti-Friction for Wood Track..55%
Zenith for Wood Track..... 55%
ed's Steel Arm..... 50%
allenge, Barn Door 50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00 ..... 50&2%
Cheritree ..... 50&10%
Kidder's ..... 50&10&60%
The Boss ..... 60&10%
Best Anti-Friction ..... 60&10%
Duplex (Wood Track)..... 60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00 ..... 50&5&50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00 ..... 50&15&60%
Wood Track Iron Clad, ₱ ft. 10¢..... 50 &15&60%
Carrier Steel Anti-Friction.....50&50&5%
Architect, ₱ set $6.00 ..... 20%
Eclipse ..... 20&10%
Felix, ₱ set $4.50 ..... 20%
Richards' ..... 30&30&10%
Lane's Steel Anti-Friction 50%
Ball Bearing Door Hanger..20&10&25&10%
Warner's Pat ..... 20&20&10%
Stearns' Anti-Friction ..... 20&20&10%
Stearns' Challenge.....25&10&25&10&10%
Faultless ..... 40&40&5%
American, ₱ set $6.00 ..... 20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢ 40%
Paragon, Nos. 1, 2 and 3 ..... 40&10%
Paragon, Nos. 5, 5½, 7 and 8..... 20&10%
Crescent ..... 60&60&10%
Nickel, Cast Iron 50%
Nickel, Malleable Iron and Steel..... 40%
Scranton Anti-Friction Single Strap..33⅓&%
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction 40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00 ..... 45%
Star ..... 40&10@40&10&5%
May ..... 50&5&50&10%
Barry, $6.00 ..... 40&10%

Harness Snaps—
See Snaps.

Hatchets—
List Jan. 1, 1886.
Isaiah Blood ..... 35@40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad 40%
Buffalo Hammer Co..... 40&10&50%
Hurd's ..... 40&10&50%
Fayette R. Plumb..... 40&10&50%
Wm. Mann, Jr., & Co..... 50&50&5%
Underhill Edge Tool Co.....40&5&40&10%
Underhill's, Haines and Bright..... 33⅓&%
C. Hammond & Son..... 40&10&50%
Simmons' ..... 40&10&50%
Peck's ..... 40&10@40&10&5%
Kelly's ..... 50&50&5%
Sargent & Co 50%
Ten Eyck Edge Tool Co.40&10@40&10&5%
Collins 10%
Schulte, Lohoff & Co..... 50@50&5%

Hay and Straw Knives—
Lightning...Mfrs'. price ₱ doz $18.00, 25% But jobbers frequently give extras.
Gem ..... ₱ doz $10
Wadsworth's ..... 40&7½@40&10%
Carter's Needle..... ₱ doz $11.50@$12.00
Heath's ..... ₱ doz $13.50@14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw 40%
Nolin's Hay ..... ₱ doz $10.00

Hinges—
Wrought Iron Hinges
Strap and T ..... 75&5@75&10%
Screw Hook and Strap: 6 to 12 in., ₱ ℔ ..... 3¼¢; 14 to 20 in., ₱ ℔ .. 3¼¢; 22 to 36 in., ₱ ℔ ..2¾¢
Heavy Welded Hook: 6 to 12 in., ₱ ℔ ..... 3¾¢; 14 to 20 in., ₱ ℔ .. 3¾¢; 22 to 36 in., ₱ ℔ ..2¾¢
Screw Hook and Eye: ½ in., ₱ doz $1.50; ⅝ in., ₱ doz $2.45; ¾ in., ₱ doz $3.80 ..... 10%
Rolled Blind Hinges, Nos. 32 and 34 ..... 50&10%
Rolled Blind Hinges, Nos. 232 and 234 ..... 55&10%
Rolled Plate ..... 70&10%
Rolled Raised ..... 70&10%
Plate Hinges (8, 10 & 12 in., ₱ ℔ .....5¢
"Providence" over 12 in., ₱ ℔ ....4¢
Spring Hinges—
Geer's Spring and Blank Butts..... 40%
Union Spring Hinge Co.'s list, March, 1886 ..... 20%
Acme 30%
U. S. ..... 25&10%
Empire and Crown 20%
Hero and Monarch 55%
American, Gem, and Star..... 20%
Oxford 20%
Barker's Double Acting..... 20&10%
Union Mfg. Co 25%
Bommer's 30%
Buckman's ..... 15&20%
Chicago 30%
Wiles' 10%
Devore's 40%
Rex 40%
Royal 60%
Reliable 60%
Champion 60%
Gate Hinges—
Western ..... ₱ doz $4.40, 60%
N. E. ..... ₱ doz $7.00, 55%
N. E. Reversible ..... ₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3 ..... 60&10&5%
N. Y. State ..... ₱ doz $5.00, 55&10%
Automatic ..... ₱ doz $14.50, 50%
Common Sense..... ₱ doz pair $4.50, 50%
Seymour's ..... 45&10%
Shepard's ..... 60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%
Blind Hinges—
Parker ..... 75&2%
Palmer ..... 50&5&10%
Seymour ..... 70&2%
Nicholson ..... 45&10%
Hotter 50%
Clark's, Nos. 1, 3, 5, 10 and 50 ..... 75&10&5@80%
Clark's Mortise Gravity 50%
Sargent's, Nos. 1, 3, 5, 11, 13 ..... 75&10@55&10&5%
Sargent's, No. 12 ..... 77&10&10%
Reading's Gravity..... 75&10@75&10&5%
Shepard's
Noiseless ..... 75&10&5%
Niagara ..... 80&2½%
Buffalo ..... 80&5%
Clark's Genuine Pat ..... 80&5%
O. S., Lull & Porter ..... 75&10@80%
Acme, Lull & Porter ..... 75&5%
Queen City Reversible 75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3 ..... 75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50 ..... 25&2%

Hoes—
Handled—
Garden, Mortar, &c 65%
Planter's, Cotton, &c 65%
Warren Hoe 60%
Magic ..... ₱ doz $4.00
Eye—
D. & H. Scovil 20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat ..... 45&5%
Sandusky Tool Co., S. & O. Pat..... 60%
Hubbard & Co., S. & O. Pat 60%
Chattanooga Tool Co., S. & O. Pat..60%
Grub ..... 60@60&10%

Hog Rings and Ringers—
Hill's Improved Ringers. . . ₱ doz $4.25
Hill's Old Style Ringers..... ₱ doz $2.75
Hill's Tongs ..... ₱ doz $4.50
Hill's Rings..... ₱ doz bxs $2.15@2.25
Perfect Rings..... ₱ doz bxs $1.60@1.70
Perfect Ringers..... ₱ doz $2.15@$2.25
Blair's Hog Ringers..... ₱ doz $2.25@2.50
Blair's Hog Rings..... ₱ doz 90¢@$1.00
Champion Ringers ..... ₱ doz $2.00
Champion Rings, Double..... ₱ doz $2.25
Brown's Ringers..... ₱ doz $2.00
Brown's Rings..... ₱ doz $1.25@1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake 20%
Moore's Differential Pulley Block... 40%
Energy Mfg. Co's 25%

Holders, File and Tool—
Balz Pat ..... ₱ doz $4.00; 25%
Nicholson File Holders 20%

Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground ..... 60@60&5%
Unground ..... 60&10@60&10&10%
Boilers and Saucepans ..... 40&5%
Tinned Boilers and Saucepans..... 40%
Gray Enameled-Ware—
Stove ..... 45@50%
Maslin Kettles..... 60&10@60&10&10%
Boilers and Saucepans..... 40&5%
Agate and Granite Ware, list Jan. 1, 1889 ..... 33⅓&10%
Rustless Hollow-Ware..... 50@50&5%
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—
4 mo. or 5 % cash in 30 days.
Reed & Barton ..... } 40&5%
Meriden Britannia Co ..... } 40&5%
Simpson, Hall, Miller & Co..... } 40&5%
Rogers & Brother ..... } 40&5%
Hartford Silver Plate Co ..... } 40&5&5%
William Rogers Mfg. Co..... } 40&5&5%

Hooks—
Cast Iron—
Bird Cage, Sargent's list..... } 60&10&10%
Bird Cage, Reading..... } 60&10&10%
Clothes Line, Sargent's list.. } 60&10&10%
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list. ..... 55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%
Wrought Iron—
Cotton ..... ₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)...50%
Wrought Staples, Hooks, &c. See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886 ..... 50%
Wire Coat and Hat, Miles', list April, 1886 ..... 50%
Indestructible Coat and Hat..... 45%
Wire Coat and Hat, Standard..... 45%
Belt ..... 80@80&10%
Miscellaneous.
Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass ..... ₱ doz $2.25
Bush ..... 55&60%
Whiffletree—Patent 55%
Hooks and Eyes—Malleable Iron. 70&70&10%
Hooks and Eyes—Brass..... 60&10&10%
Fish Hooks, American 50%
Bench Hooks ..... See Bench Stops.

Horse Nails—

Nos.	6	7	8	9	10
Ausable.....	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin.. ..... 10½ @ 11¢, net
Essex ..... 28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Lyra ..... 25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Snowden ..... 25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Putnam..... 23¢ 21¢ 20¢ 19¢ 18¢. 1000 ℔ in year 15%
Vulcan..... 23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n. 25¢ 23¢ 22¢ 21¢ 20¢. 10&10&5&5%
Globe ..... 23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston..... 25¢ 21¢ 20¢ 19¢ 18¢..20&2½%
A. C..... 25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
C. B.-K..... 25¢ 23¢ 22¢ 21¢ 20¢. 25¢10@33⅓&5%
Champlain .28¢ 6¢ 25¢ 24¢ 2¾¢. 25&10&10%
New Haven..28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Saranac..... 23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion ...25¢ 23¢ 22¢ 21¢ 20¢. 10&10&10%
Capewell..... 28¢ 26¢ 25¢ 24¢ 23¢. 35&5@35&10%
Star..... 23¢ 21¢ 20¢ 19¢ 18¢. 10¢10¢10&12½%
Anchor..... 23¢ 21¢ 20¢ 19¢ 18¢..... 35%
Western..... 23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronzed. ..... 14 ₱ ℔.

Horse Shoes—See Shoes Horse.

Hose, Rubber—
Competition..... 75&10@75&10&5%
Standard..... 70@70&10%
Extra..... 66@60&10%
N. Y. B. & P. Co., Para..... 30&10%
N. Y. B. & P. Co., Extra..... 50%
N. Y. B. & P. Co., Dundee..... 60&10&5%

Huskers—
Blair's Adjustable..... ₱ gr $8.00
Blair's Adjustable Clipper..... ₱ gr 7.00

Indurated Fiber-Ware—25%.
Spittoons, No. 2, ₱ doz $9.00
Basins, Ringed, ₱ doz., No. 1, $4.80; No. 2, $4.20; No. 3 ..... $3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest $7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest $5.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest $2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₱ set $4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set $3.00
See also *Pails*.

Jack Screws—See Screws.

Kettles—

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ ℔	24¢	21 ¢
Brass larger than 17 in., ₱ ℔	26¢	23½¢

Enameled and Tea Kettles. See *Hollow-Ware*.

Keys—
Lock Asso'n list Dec. 30, 1886...50&10&60&5%
Eagle, Cabinet, &c ..... 33⅓&2%
Hotchkiss' Brass Blanks 40%
Hotchkiss, Copper and Tinned..... 40%
Hotchkiss' Pad. and Cab 35%
Ratchet Bed Keys..... ₱ doz $4.00, 15%
Wollensak Tinned..... 50&10%

Knife Sharpeners—
Parkin's.
Applewood Handles... ₱ doz $6.00, 40%
Rosewood or Cocobolo. ₱ doz $9.00, 40%

Knives—
Wilson's Butcher Knives..... 25@30%
Ames' Butcher Knives 25%
Foster Bros.' Butcher, &c..... 40%
Nichols' Butcher Knives..... 40&10%
Ames' Shoe Knives..... 20@25%
Ames' Bread Knives. ₱ doz $1.50, 15@20%
Moran's Shoe and Bread..... 20%
Hay and Straw..... See Hay Knives.
Table and Pocket..... See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent..... $3.50

Knobs—
Door Mineral..... 65@68%
Door Por. Jap'd..... 75@78%
Door Por. Nickel..... $2.00@2.25
Door Por. Plated, Nickel..... $2.00@2.25
Drawer, Porcelain..... 60&10@60&10&10%
Hemacite Door Knobs..... 40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain..... 75¢ gro inch, 10%
Furniture, Wood Screws..... 25&10%
Base, Rubber Tip..... 70&10&5%
Picture, Judd's..... 50&10&10&70%
Picture, Sargent's..... 70&10%
Picture, Hemacite..... 35&5%
Shutter, Porcelain..... 65&10%
Carriage, Jap..... ₱ gro 80¢, 60&10%

Ladles.—
Melting, Sargent's..... 55&10%
Melting, Reading ..... 35&10%
Melting, Monroe's Pat... ₱ doz $4.00, 40%
Melting, P. S. & W..... 35&10@40%
Melting, Warner's..... 30%

Lawn Mowers—
Standard List..... 50&10%
Quaker City..... 60&10%
Enterprise..... 60&10%

Lanterns—
Tubular—
Plain with Guards, ₱ doz..... $4.00@4.25
Lift Wire, with Guards..... $4.50@4.75
Square Plain, with Guards..... $4.00@4.25
Sq. Lift Wire, with Guards..... $4.25@4.50
Without Guards, 25¢ ₱ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75 ..... 20@25%

Lemon Squeezers—
Porcelain Lined, No. 1.... ₱ doz $6.00, 25&30%
Wood, No. 2..... ₱ doz $3.00, 35%
Wood, Common..... ₱ doz $1.70@1.75
Dunlap's Improved ..... ₱ doz $3.75, 20%
Sammis..... No. 1, $6.00; No. 2, $9; 12, $18 ₱ doz..... 25&10%
Jennings' Star..... ₱ doz $2.50
The Boss..... ₱ doz $2.50
Dean's..No. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90
Little Giant..... 50@50&5%
King..... 40&5%

Lines—
Cotton and Linen Fish, Draper's..... 50%
Draper's Chalk..... 60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25..... 25%
Cotton Chalk..... 55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro..... 25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton..... 15%
Wire Clothes.. Nos. 18 19 20
$3 60 $3.00 $2.5
Ventilator Cord, Samson Braided, White or Drab Cotton.. ₱ doz $7.50, 20%

Locks, &c.—
Door Locks, Latches, &c.
R. & E. Mfg. Co., list Mar. 20, 1889 ..... } 60&10@60 &10&10%
Mallory, Wheeler & Co., list July, '88 ..... } 60&10@60 &10&10%
Sargent & Co., list Aug. 1, '88 ..... } 60&10@60 &10&10%
Reading Hardware Co., list Feb. 2, '88 ..... } 60&10@60 &10&10%
Note.—Lower net prices often made.
Perkins' Burglar Proof..... 60&25%
Plate..... 33⅓&2%
F. Many's "Extension Cylinder" $10.50 ₱ doz.
Barnes Mfg. Co..... 40@40&10%
Yale..... net prices
Deitz Flat Key..... 30%
L. & C. Round Key Latches..... 30&10%
L. & C. Flat Key Latches..... 33⅓&10%
Romer's Night Latches..... 15%
Shepardson or U. S..... 35%
Feiter or American..... 40&10%
Seed's N. Y. Hasp Lock..... 25%
Cabinet—
Eagle, Gaylord Parker and Corbin... } List March, '84, Jan. 1, '85.. 33⅓&2%
Deitz, Nos. 36 to 39..... 40%
Deitz, Nos. 51 to 63..... 40&10%
Deitz, Nos. 86 to 96..... 30%
Stoddard Lock Co..... 30&33⅓&%
"Champion" Night Latches..... 40%
Barnes Mfg. Co..... 40@40&10%
Eagle and Corbin Trunk..... 25&2%
"Champion" Cab. and Combin.. 33⅓&%
Yale..... net prices
Romer's..... 25%
Padlocks—
List Dec. 23, '84..... 75@75&10%
Yale Lock Mfg. Co.'s..... net prices
Eagle..... 25&2%
Eureka, Eagle Lock Co..... 40&2%
Romer's, Nos. 0 to 91..... 30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz..... 40%
Champon Padlocks..... 40%
Hotchkiss..... 30%
Star..... 45%
Horseshoe..... ₱ doz, $9, 40@40&10%
Barnes Mfg. Co..... 40@40&10%
Nock's..... 30%
Brown's Pat..... 25%
Scandinavian..... 90@90&10%
Fraim's Pat. Scandavian low list..... 60%
Ames Sword Co. up to No. 150..... 40%
Ames Sword Co. above No. 150..... 50%

Lumber Tools.
Ring Peavies, "Blue Line"... ₱ doz $20.00
Ring Peavies, Common..... ₱ doz $18.00
Steel Socket Peavies..... ₱ doz $21.00
Mall. Iron Socket Peavies.... ₱ doz $19.00
Cant Hooks, "Blue Line"... ₱ doz $16.00
Cant Hooks, Common Finish.. ₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish..... $16.00
Cant Hooks, Mall. Socket Clasp, Common Finish..... ₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish..... ₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish..... ₱ doz $12.00
Hand Spikes.... ₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks..... ₱ doz $18.00

Lustro—
Four-ounce Bottles.... ₱ doz, $1.75; ₱ gross..... $17.00

Mallets—
Hickory..... 20&10@20&10&10%
Lignumvitæ..... 20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Match Safes—
Dangerfield's Self-Igniting... ₱ doz $1.5

Mattocks. Regular list..... 60@60&10%

Meat Cutters—
Dixon's ₱ doz..... 40&5%

Nos.....	1	2	3	
	$14.00	$17.00	.	$0.00

Woodruff's ₱ Jo[illegible] ..... 40&5%

Nos...	.....	100	150
		$15.00	$18.00

Champion ₱ doz ..... 40&45%

Nos.....	200	300	400
	$22.00	$27.00	$40.00

Hales Pattern ₱ doz..... 70@70&5%

Nos.....	11	12	13
	$27.00	$33.00	$45.00

American..... 30%

Nos.....	1	2	3	4	5
Each.....	$5	$7	$10	$25	$50	$60

Enterprise..... 30%

Nos.....	10	12	22	32	42
Each.....	$3	$2.50	$4	$6	$15

Pennsylvania..... 40&10%

Nos.....	1	2	3	00
₱ doz....	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₱ doz..... 45@45&10%

Nos.....	1	2	3
	$22.00	$30.00	$40.00

Home No. 1..... ₱ doz, $26.00, 55&10%
Draw Cut, each:

Nos..	5	2	6	8	
	$50	$75	$80	$225	.....20@25%

Beef Shavers (Enterprise)..... 20&10@30%
Chadborn's Smoked Beef Cutter. ₱ doz $36.00

Mincing Knives—
Am. (2d quality., ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18..... net
Lothrop's..... 20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles..... 50&10@60%
Buffalo Adjustable. .....₱ doz. $3.00, 25%

Molasses Gates—
Stebbin's Pat..... 70@70&7½%
Stebbin's Genuine..... 60@10&10%
Stebbin's Tinned Ends..... 40@10%
Chase's Hard Metal..... 50&10%
Bush's..... 20%
Lincoln's Pattern..... 70@70&10
Weed's..... 20@10%
Boss, ₱ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4 $10..... 60@10&10%

Money Drawers....₱ doz, $18@$20

Muzzles—
Safety..... ₱ doz, $3.00, 25 %

Nails, see Trade Report.
Wire Nails, Papered.
Association list, July 15, 1889..... 70&10%10@70&10%10&5%
Tack Mfrs.' list..... 70@70&5%
Wire Nails, Standard Penny.
Card June 1, '89, base..... $2.40@$2.50

Nail Puller—
Curtiss Hammer..... ₱ doz $9.00
Giant, No. 1..... ₱ doz. $30.00, 10%
Pelican..... ₱ doz, $9.00, 25%
Boss..... ₱ doz, $30.00, 30%
Lightning..... ₱ doz $21.00

Nail Sets—
Square..... ₱ gr., $4.00@$4.25
Round..... ₱ gr. $3.25
Cannon's Diamond Point...₱ gr.,$12, 20%

Nut Crackers—
Table (H. & B. Mfg. Co.)..... 40%
Blake's Pattern..... ₱ doz $2.00, 10%
Turner & Seymour Mfg. Co..... 50%

Nuts—
Nuts, off list Jan. 1, 1888: Square. Hex.
Hot Pressed..... 5.4¢ 5.9¢
Cold Punched..... 5.4¢ 5.5¢
In lots less than 100 ℔, ₱ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—
Government..... ₱ ℔ 7½@7¾¢
U. S. Navy..... ₱ ℔ 6½@6¾¢
Navy..... ₱ ℔ 5½¢@5¾¢

Oilers—
Zinc and Tin..... 65@65&10%
Brass and Copper..... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&10%
Malleable, Hammers, Old Pattern, same list..... 40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass..... 50%
Olmstead's Tin and Zinc..... 60%
Olmstead's Brass and Copper..... 50%
Broughton's Zinc..... 60%
Broughton's Brass..... 50%
Gem P. D. & Co..... ₱ gro. $2

Packing, Steam—
Rubber—
Standard..... 60&10@60&10&10%
Extra..... 50&10@60%
N. Y. B. & P. Co., Standard...50&10&5%
N. Y. B. & P. Co., Empire..... 70%
N. Y. B. & P. Co., Salamander. ₱ ℔ 65¢, 30%
Jenkins' Standard..... ₱ ℔ 80¢, 35%
Miscellaneous—
American Packing..... 10¢@11¢ ₱ ℔
Russia Packing..... 14¢ ₱ ℔
Italian Packing..... 13¢@14¢ ₱ ℔
Cotton Packing..... 15¢@17¢ ₱ ℔
Jute..... 7¢@8¢ ₱ ℔

Padlocks—
See Locks.

Pails—

Galvanized Iron— Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shephard & Co....	2.80	3.00	3.40
Iron Clad	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—25 %
Star Pails, 12 qt..... ₱ doz $6.00
Fire, Stable and Milk, 14 qt..₱ doz $7.80

Standard Fibre Ware—	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	5.00	
Fire Pails, No. 2, 14 qt. per doz	4.50	

Pencils—
Faber's Carpenters'..... high list 50%
Faber's Round Gilt..... ₱ gro $5.25
Dixon's Lead..... ₱ gro $4.50
Dixon's Lumber..... ₱ gro $6.75
Dixon's Carpenters'..... 40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00..... 50&10&5 @ 60%

Picture Nails—
Brass Head, Sargent's list..... 50&10&10%
Brass Head, Combination list..... 50&10%
Porcelain Head, Sargent's list..50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent..... 40%

Pinking Irons— ₱ doz 65¢ net

Pipe, Wrought Iron—
List March 23, 1887.
1¼ and under, Plain..... 50%
1¼ and under, Galvanized..... 42½%
1½ and over, Plain..... 62½%
1½ and over, Galvanized..... 50%
Boiler Tubes, Iron.
1¾ and under..... 52½%
2 in. and larger..... 57½%

Planes and Plane Irons—
Wood Planes—
Molding..... 50&10&60%
Bench, First Quality..... 60@60&5%
Bench, Second Quality..... 60&10&10@70%
Bailey's (Stanley R. & L. Co.)..... 40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.)..... 40@10%
Miscellaneous Planes (Stanley R. & L. Co.)..... 20&10%
Victor Planes (Stanley R. & L. Co.)..20&10%
Steer's Iron Planes..... 35@35&5%
Meriden Mal. Iron Co.'s..30&10@30&10&10%
Davis's Iron Planes...30&10@30&10&10%
Birmingham Plane Co..... 50@50&5%
Gage Tool Co.'s Self-Setting..... 20&10%
Chaplin's Iron Planes..... 40@40&5%
Sargent's..... 30&10@30&10&10%
Plane Irons—
Plane Irons..... 20&10%
Plane Irons, Butcher's...$5.00@$5.25 to £
Plane Irons, Buck Bros..... 30%
Plane Irons, Auburn Tool Co., "Thistle"..... 40%
Sandusky Tool Co.:
Single and Cut..... 30%
Double..... 40%
L. & I. J. White..... 25%

Pliers and Nippers—
Button's Patent..... 30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz..... 20&10@35%%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers..... 60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers..... 40%
Russell's Parallel..... 25%
P. S. & W. Cast Steel..... 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters..... 30%
Morrill's Parallel, ₱ doz, $12.00...30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List..... 70&10@70&10&10%
Disston's..... 45&10%
Pocket Levels..... 70&10@70&10&10%
Davis Iron Levels..... 30%
Davis' Inclinometers..... 10&10%

Polish, Metal.
Prestoline..... 20&10%
Krestoline Paste..... 33⅓%
Gaston's Silver Compound..... 33⅓%

Pokes, Animal—
Bishop's I. X. L..... ₱ doz $6.50
Bishop's O. K..... ₱ doz $5.50
Bishop's Pioneer..... ₱ doz $3.75
Bishop's American..... ₱ doz $3.00

Poppers, Corn—
Round or Square, 1 qt..₱ gr $12.00@15.00
Round or Square, 2 qt..₱ gr $25.00@26.00

Post Hole and Tree Augers and Diggers—
Samson Post Hole Digger, ₱ doz $36.00, 25&10%
Fletcher Post Hole Augers, ₱ doz $36, 20%
Eureka Diggers..... ₱ doz $16.00@17.00
Leed's..... ₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant..... ₱ doz $18.00
Kohler's Hercules..... ₱ doz $15.00
Kohler's New Champion..... ₱ doz $9.00
Schneidler..... ₱ doz $18.00
Ryan's Post Hole Diggers..... ₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₱ doz $30.00, 50%
Imperial, ₱ doz, $15..... 40%

Potato Parers—
White Mountain..... ₱ doz $5.00@5.50
Antrim Combination..... ₱ doz $8.00
Hoosier..... ₱ doz $13.50

Pruning Hooks and Shears—
Disston's Combined Pruning Hook and Saw..... ₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools..... 40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co.. No. 1, $5.25; No. 2, 7.25

Pulleys—
Hot House, Awning, &c..... 60&10%
Japanned Screw..... 60&10%
Brass Screw..... 60&10%
Japanned Side..... 66⅔&10%
Japanned Clothes Line..... 60&10%
Empire Sash Pulley..... 55&60%
Moore's Sash, Anti-Friction..... 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50..... 50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70..... 50%
Hay Fork, "F" Common and Pat. Bushed..... 20%
Hay Fork, Tarbox Pat. Iron..... 20%
Hay Fork, Reed's Self-Lubricating...60%
Shade Rack..... 45%
Tackle Blocks..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00..... 40%

Pumps—
Cistern, Best Makers..... 50&10@60%
Pitcher Spout, Best Makers..60&10@60 &10&10%
Pitcher Spout, Cheaper Goods...70&5@ 70&10&5%

Punches—
Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket..50&5%
Spring, good quality...₱ doz $2.50@2.60
Spring, Leach's Pat..... 15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners'..... ₱ doz $1.44, 55%
Tinners' Hollow Punches..... 20&2%
Rice Hand Punches..... 15%
Avery's Revolving..... 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass, ₱ ℔ 35¢..... 15%
Sliding Door, Bronzed Wr't Iron, ₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light. In. ½ ¾ 1
Per 100 feet..... $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet...$2.15 2.70 3.25..net
Terry's Wrought Iron, ₱ foot.....4½@5¢
Victor Track Rail, 7¢ ₱ foot..... 50&2%
Carrier Steel Rail, ₱ foot..... 4½¢
Moore's Wrought Iron..... 25%

Rakes—
Cast Steel, Association goods..... 65%
Cast Steel, outside goods..... 60&10@70%
Malleable..... 70&70&5%
Gibbs Lawn Rake..... $12.00, 50&15%
Canton Lawn Rake..... $9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless..... 65%
Fort Madison Steel Tooth Lawn Rake, $6.00..... 25%

Razors—
J. R. Torrey Razor Co..... 20%
Wostenholme and Butcher, $10.00 to £, 10%

Razor Strops—
Genuine Emerson..... 60@60&5%
Imitation "..... ₱ doz $2.00, 20&10&5%
Torrey's..... 20%
Badger's Belt and Com..... ₱ doz $2.00
Lamont Combination..... ₱ doz $4.00

Rivets and Burrs—
Iron, list Nov. 17, '87..... 50%
Copper..... 50&10@60%

Rivet Sets..... 50&10%

Rods—
Stair, Brass..... 25&2%
Stair, Black Walnut..... ₱ doz 40¢

Rollers—
Barn Door, Sargent's list..... 60&10&10%
Acme Moore's Anti-Friction..... 55%
Union Barn Door Roller..... 70%

Rope—
Manufacturers' prices for large lots:
Manila...½ in. and larger ₱ ℔ 13 ¢
Manila..... ⅜ in. ₱ ℔ 13½¢
Manila..... ¼ and 5-16 in. ₱ ℔ 15¾¢
Manila Tarred Rope..... ₱ ℔ 12½¢
Manila, Hay Rope..... ₱ ℔ 13 ¢
Sisal...½ inch and larger ₱ ℔ 11 ¢
Sisal..... ⅜ in. ₱ ℔ 11½¢
Sisal..... ¼ and 5-16 in. ₱ ℔ 13 ¢
Sisal, Hay Rope..... ₱ ℔ 11 ¢
Sisal, Tarred Rope..... ₱ ℔ 10¾¢
Sisal, Medium Lathe Yarn. ₱ ℔ 10 ¢
Cotton Rope..... ₱ ℔ 15@18¢ net
Jute Rope..... ₱ ℔ 8¢
1½% for cash in 10 days.

Rules—
Boxwood..... .80&10&10@80&10&10&5%
Ivory..... 50@50&10%
Starrett's Rules and Straight Edges, Steel..... 25&10%

Sad Irons—
From 4 to 10, at factory...₱ 100 ℔, $2.40@$2.55
Self-Heating..... ₱ doz $9.00 net
Self-Heating, Tailors'..₱ doz $18.00 net
Gleason's Shield and Toilet..... 25%
Mrs. Pott's Irons..... 40@40&10%
Enterprise Star Irons..... 40%
Combined Fluter and Sad Iron, ₱ doz, $15.00..... 15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England..... 5¢, 15%
Mahony's Troy Pol. Irons..... 25%
Sensible..... 20@20&5%
National Self-Heating..... 30 %

Sand and Emery Paper and Cloth—
List April 19, 1886..... 50@50&10%
Sibley's Emery and Crocus Cloth..... 30%

Sash Cord—
Common..... ₱ ℔, 10@11¢
Patent, good quality..... ₱ ℔ 13@13½¢
White Cotton Braided, fair..₱ ℔ 28@29¢
Common Russia Sash..... ₱ ℔ 13½¢
Patent " " ₱ ℔ 15¢
Cable Laid Italian Sash..... ₱ ℔ 22¢@23¢
India Cable Laid " ..... ₱ ℔ 13¢
Silver Lake—
A Quality, White, 50¢..... 10&10&5%
A Quality, Drab, 55¢..... 10&10&5%
B Quality, White, 50¢..... 20&10&5%
B Quality, Drab, 55¢..... 20&10&5%
C Quality, White (only)..... 26½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White..... 30¢
Egyptian, India Hemp, Braided..... 25¢
Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢...30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢..... 30@30&5%

Sash Locks—
Clark's, No. 1, $10; No. 2, $8 ₱ gr.. 33⅓%
Ferguson's..... 33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor..... 60&10&2%
Walker's..... 10%
Attwell Mfg. Co..... 25&33⅓%
Reading..... 66⅔&10@66⅔&10&10%
Hammond's Window Springs..... 40%
Common Sense, Jap'd, Cop'd and Br'zed..... ₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal..... 30%
Kempshall's Gravity..... 60%
Kempshall's Model..... 60@60&10%
Corbin's Daisy, list Feb. 15, 1886..... 70%
Payson's Perfect..... 60@60&10%
Hugunin's Sash Balances..... 25&5&2%
Hugunin's New Sash Locks..... 25&5&2%
Stoddard "Practical"..... 10%
Ives' Patent..... 60@60&10%
Lesche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00..... 20&10%
Davis, Bronze, Barnes Mfg. Co..... 50%
Champion Safety, list March 1, 1888 55@55&5%
Security..... 70%
Buckeye..... ₱ gro $4.80

Sash Weights—
Solid Eyes..... ₱ ton $22.00

Sausage Stuffers or Fillers—
Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry..... ₱ doz, No. 1, $15.00; No. 0, $21.00..... 50&5@50&10%
Draw Cut No. 4, each $30.00..... 20%
Enterprise Mfg. Co..... 20&10@30%
Silver's..... 40&10%

Saws—
Disston's Circular..... 45@45&5% | Extras sometimes given by jobbers.
Diston's Cross Cuts..... 45@45&5%
Disston's Hand 25@25&5%
Atkins' Circular Shingle and Heading 50&10%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts..... ₱ foot 24@25¢
Atkins' Hollow Back X Cuts..₱ foot 18¢
Atkins' Mulay, Mill and Drag..... 40&10%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand..... 30&5@30&10%
W. M. & C., Champion X Cuts, Regular..... ₱ foot 24@26¢
W. M. & C. X Cuts, Thin Back..... ₱ foot 27¢@29¢
Peace Circular and Mill..... 45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard...₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's, complete..... 40&10@50%
Griffin's Hack Saw, Blades...40&10@50%
Star Hack Saws and Blades..... 25%
Diamond Hack Saws and Blades..... 25%
Eureka and Crescent..... 25%

Saw Frames—
White Vermont..... ₱ gro $9.00@10.00
Red, Polished and Varnished..... ₱ doz $1.50, 25%

Saw Sets—
Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita..... ₱ doz $3.25@5.25, 40&5@40&10%
Common Lever..... ₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 15&20%
Nash's..... 20&10@20&10&10%
Hammer, Hotchkiss..... $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer..... 30&5%
Bemis & Call Co.'s Plate..... 10%
Bemis & Call Co.'s Cross Cut..... 12½%
Aiken's Genuine..... $13.00, 50&10%
Aiken's Imitation..... $7.00, 55&5%
Hart's Pat. Lever..... 20%
Disston's Star, #9, No. 15, $5.50; 20@10@20&10@10%
Atkin's Lever, ₱ doz No. 1, $6.00; No. 2, $9.60
Atkin's Criterion..... ₱ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00..... 40&10%
Avery's Saw Set and Punch..... 50%
Am. Tool Co.'s Superior..... ₱ doz $15, 50%

Saw Tools—
Atkins' Perfection..... ₱ doz $15.00
Atkins' Excelsior..... ₱ doz $6.00
Atkins' Giant..... ₱ doz $4.00

Scales—
Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161..... ₱ doz $6.75@7.00
Union Platform, Plain..... $2.10@2.20
Union Platform, Striped..... $2.20@2.30
Chatillon's Grocers' Trip Scales..... 50%
Chatillon's Eureka..... 25%
Chatillon's Favorite..... 40%
Family, Turnbulls..... 30@30&10%
Richie Bros.' Platform..... 40%

Scale Beams—
Scale Beams, List Jan. 12, '82...50&10@ 50&10&5%
Chatillon's No. 1..... 40%
Chatillon's No. 2..... 50%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50..... 30&10%
Box, 1 Handle..... ₱ doz $4.00, 10%
Box, 2 Handle..... ₱ doz $6.00, 10%
Defiance Box and Ship..... 20&10%
Foot..... 50&10&60%
Ship, Common..... ₱ doz $3.50 net
Ship, R. I. Tool Co..... 10%

Screen Window and Door Frames—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons...33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@25&10%

Screw Drivers—
Douglas Mfg. Co..... 20&10&10%
Disston's..... 45&10%
Disston's Pat. Excelsior..... 45&10%
Buck Bros..... 30%
Stanley R. & L. Co.'s Varnished Handles..... 65&10%
Black Handles..... 60&10%
Sargent & Co.'s No. 1 Forged Blade..... 60&10&10%
Nos. 20, 30 and 60..... 66⅔&10&10%
Knapp & Cowles' No. 1..... 60&20@70%
No. 1 Extra..... 60@60&10%
Nos. 00 & 4..... 50&5@50&10&5%
Stearns'..... 25&10&5%
Gay & Parsons..... 35%
Champion..... 25&10%
Clark's Pat..... 30@33⅓%
Crawford's Adjustable..... 30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list..... 25%
Kolb's Common Sense ₱ doz $6.00, 25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw Driver Bits..... ₱ doz 50@75¢
Screw-Driver Bits, Parr's..... ₱ gro $6.25
Fray's Hol. Hdle. Sets. No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel..... 50%

Screws—
Wood Screws—List March 1, 1889

Flat Head Iron..... 50%	Extra 5 @ 10 % often given
Round Head Iron..... 40%	
Flat Head Brass..... 45%	
Round Head Brass..... 35%	
Flat Head Bronze..... 45%	
Round Head Bronze. 35%	

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%
Bench and Hand—
Bench, Iron.....55&10@55&10@10%
Bench, Wood, Beech.....₱ doz $2.25
Bench, Wood, Hickory.....20@10%
Hand, Wood.....25&10@25&10@5%
Lag, Blunt Point, according to size.....80@80&5%
Coach and Lag, Gimlet Point.....75%
Bed.....25&5%
Hand Rail, Sargent's.....60%&10%
Hand Rail, H. & B. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60@10@60@10&5%
Jack Screws Stearns'.....40@40&10%

Scroll Saws—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths.....50&2%

Shears—
American (Cast) Iron...75&10@75&10@5%
Pruning...See Pruing Hooks and Shears.
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners'.....20@2%
Seymour's, List, Dec., 1881.
60@10&10@60@10&10@5%
Heinisch's, List, Dec., 1881.
60@10&10@60@10&10@5%
Heinisch's Tailor's Shears.....33⅓%
First quality C. S. Trimmers..80@80@10%
Second quality C. S. Trimmers.
80@10@80@10@10%
Acme Cast Shears.....10@10%
Diamond Cast Shears.....10%
Clipper.....10@10%
Victor Cast Shears.....75&10@75&10@5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list.60%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50&10@60&10%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, at factory. $4.00
Mule—
Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ ℔ 9¢
1000 ℔ lots.....₱ ℔ 9½¢
500 ℔ lots.....₱ ℔ 10¢

Shot—
(Eastern prices 2¢ off, cash, 5 days.
Drop, ₱ bag, 25 ℔.....$1.25
Drop, ₱ bag, 5 ℔.....30
Buck and Chilled, ₱ 25-℔ bag.....1.50
Buck and Chilled, ₱ 5-℔ bag.....35

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).20%
St. Louis Shovel Co.....20@20@7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20@7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January, 1886.....30%
Remington's (Lowman's Pat.).30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel, list Nov. 1, 1887.20%
Coldbrookdale Iron Co.....50&10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—
Buffalo Metallic, S. S. & Co...50&25&10%
Shaker (Barler's Pat.) Flour Sifters.....
₱ doz $2.00; ₱ gr $21.00
Electric.....₱ gr $18.00
Hunter's.....₱ gr $21.60
Smith's Adjustable Sifters.....₱ doz $2.00
Smith's Adjustable Milk Strainer.
₱ doz $2.00
Smith's Adjustable T. & C. Strainer.
₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	70¢	90¢
Mesh 20, Nested, ₱ doz..	85¢	$1.00
Mesh 24, Nested, ₱ doz..	$1.00	1.10

Slates—
School, by case.....40%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.....60&10&2%
Covered Spring.....60&10&10%

Soldering Irons—
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Spoke Shaves—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10@30%

Spoke Trimmers—
Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'.....₱ doz $9.00, 20%

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp, Co.'s list..70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....50%
C. Rogers & Bros.....50%
Rogers & Bro.....50%
Reed & Barton.....50%
Wm. Rogers Mfg. Co.....50&10@60%
Simpson, Hall, Miller & Co.....50&10
Holmes & Edwards Silver Co...60@60&5%
L. Boardman & Son.....50&10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50%
No. 49 Nickel Silver.....50&10
German Silver.....50&5&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5&50&10&5% cash
Britannia.....60%
Boardman's Nickel Silver.....50 } more
Boardman's Britannia Spoons, case lots.....60 } ⬅

Springs—
Elliptic, Concord, Platform and Half Scroll.....60@60&5%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron..... } 75&10@80%,
Nickel-Plated..... } full cs. ex. 10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares.
25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Standard Fibre Ware—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¼ in.....		4.00
Cuspidors.....		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.

Staples—
Fence Staples, Galvanized. } Same price
Fence Staples, Plain..... } as B'rb Wire. See Trd. Rep.

Steelyards.....40&10&50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5&30&10%
Lightning Screw Plate.....25&30%
Reece's New Screw Plates....33⅓&5&40%
Reversible Ratchet.....30%

Stone—
Hindostan No. 1, 3¢; Axe, 3¾¢; Slips No. 1, 4½¢
Sand Stone.....₱ ℔ 2½¢
Washita Stone, Extra.....₱ ℔ 10@20¢
Washita Stone, No. 1.....₱ ℔ 14@15¢
Washita Stone, No. 2.....₱ ℔ 10@11¢
Washita Slips, No. 1, Extra..₱ ℔ 36@38¢
Washita Slips, No. 1.....₱ ℔ 24@25¢
Arkansas Stone, No. 1, 4 to 6 in ₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in ₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₱ ℔ 40¢
Turkey Slips.....₱ ℔ $1.00@1.50
Lake Superior, Chase.....₱ ℔ 16¢
Lake Superior Slips, Chase...₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand...₱ ℔ 18@20¢
Seneca Stone, High Rounds..₱ ℔ 20@25¢
Seneca Stone, Small Whets..₱ gro $24.00

Stove Polish—
Joseph Dixon's.....₱ gro $6.00,¶10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror.....₱ pro $6.00, —¶
Lustro.....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ $5.00
Boynton's Noon Day, ₱ gro.....13.00
Parlor Pride Stove Enamel..₱ gro $ cans
Yates' Liquid, 2 5 10 gal...8¢
₱ gal ...$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 15¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₱ gro $6.00

Tacks, Brads, &c.—
List, Jan. 2, 1888.—[*Note.*—Some manufacturers are selling Tacks at slightly higher prices than those named]:
American Iron Carpet.....80@80&5%
Steel Carpet.....80@80&5%
Swedes Iron Carpet.....80@80&5%
American Iron Cut.....75&75&10%
Swedes Iron.....75&5&75&10%
Swedes Iron, Upholsterers', 75&10@80%
Tinned Swedes Iron.....75&10@80%
Tinned Swedes Iron, Upholsterers', 75&10@80%
Gimp and Lace.....75&10@80%
Tinned Gimp and Lace.....75&10@80%
Swedes Iron Trimmers'.75&10@75&10&5%
Swedes Iron Miners'...75&10@75&10&5%
Swedes Iron Bill Posters' or Railroad. 75&10@75&10&5%
Swedes Steel (Swedes Iron price list). 80@80&5%
Copper Tacks.....50&10%
Copper Finishing, Trunk and Clout Nails.....50&10%
Finishing Nails.....70&10@70&10&5%
Trunk and Clout Nails..70&10@70&10&5%
Tinned Trunk and Clout Nails, 70&10@ 70&10&5%
Basket Nails.....70&10@70&10&5%
Common and Patent Brads, 70&10@70& 10&5%
Hungarian Nails.....70&10@70&10&5%
Chair Nails.....70&10@70&10&5%
Zinc Glaziers' Points.....50@50&5%
Cigar Box Nails.....50&10@50&10&5%
Picture-Frame Points..50&10@50&10&5%
Looking Glass Tacks..50&10@50&10&5%
Leathered Carpet.....50&10@50&10&5%
Brush Tacks.....50&10@50&10&5%
Shoe Finders,' List Jan. 2, 1888, 10&10@5%
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....30&10&10%
Japanned.....20&10&10%
Double-Pointed Tacks.....85%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—
Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Tapes, Measuring—
American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale—Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—
Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓%

Tinware—
Stamped, Japanned and Pierced, list Jan. 20 1887.....75@75&5%

Tire Benders, Upsetters, &c—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Tobacco Cutters—
Champion.....20&10@30%
Wood Bottom.....₱ doz $5.00@$5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s ₱ doz, $18.00 50@55%
Wilson's.....55%
Sargent's.....₱ doz, $24, 55&10%
Acme.....₱ doz, $20.00,40%

Transom Lifters—
Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Jan. 1, 1887-
Bronzed Iron Rods.....50&10&2
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—
Game—
Newhouse.....35@40&5%
Oneida Pattern.....70@70&5%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ dz $2.50, 15%
Mouse, Bonanza.....₱ gr $10.00
Mouse Delusion.....₱ gr $15.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz 90¢
In full cases.....₱ doz 75¢

Trowels—
Lothrop's Brick and Plastering.25@25&5%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—
Butter and cheese.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

	BC.	B.
Flax Twine—		
No. 9, ¼ and ½ ℔ Balls	22¢	30¢
No. 12, ¼ and ½ ℔ Balls	21¢	29¢
No. 18, ¼ and ½ ℔ Balls	18¢	28¢
No. 24, ¼ and ½ ℔ Balls	18¢	28¢
No. 36, ¼ and ½ ℔ Balls	16¢	27¢
No. 264, Mattrass, ¼ and ½ ℔ Balls	48@50¢	
Chalk Line, Cotton, ½ ℔ Balls	25¢	
Mason Line, Linen, ½ ℔ Balls	55¢	
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)	11½¢	
3-Ply Hemp, 1 ℔ Balls	12¢@12½¢	
3-Ply Hemp, 1½ ℔ Balls	11¢@11½¢	
Cotton Wrapping, 5 Balls to ℔	15¢@16¢	
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls	10¢	
Wool	6½@6¾¢	
Paper	13¢@14¢	
Cotton Mops, 6, 9, 12 and 15 ℔ to doz.	18¢	

Vises—
Solid Box.....60@60&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....66⅔&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%

Wagon Boxes—
Per ℔.....2¼¢

Wagon Jacks—
Daisy.....25%

Washer Cutters—
Smith's Pat.....₱ doz $12.00, 20&10&10%
Johnson's.....₱ doz $11.00, 33⅓%
Penny's.₱ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₱ doz $16.00, 60&10%
Bonney's.....30&10%

Washers—

Size.....	⅛	5-16	⅜	½	⅝	¾	1
Washers....	6½	5½	4½	3½	3	3	3

In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 4 ¢

Well Buckets, Galvanized—
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top..₱ doz $4.00@.4.25

Well Wheels—
8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire—
Iron—
Market,
Br. & Ann., Nos. 0 to 18....75@75&10%
Cop'd, Nos. 0 to 18.....70@70&10%
Galv., Nos. 0 to 18.....25&10%
Tin'd, Tinned list Nos. 0 to 18.....70%
Stone,
Br. and Ann'd, Nos. 16 to 18, 72½@75@75&5%
Bright and Ann'd, Nos. 19 to 26, 75@75&10%
Br. and Ann'd, Nos. 27 to 36.....80%
Tinned.....70&10@75%
Tinned Broom Wire.....70&10@75%
Galvanized Fence.....65&5%
Annealed Fence, Nos. 8 and 9.....75&5%
Anneak d Grape, Nos. 10 to 14.....75&5%
Brass, list Jan. 18, 1884.....25@30%
Copper, list Jan. 18, 1884.....30 @ 35%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin's Steel and Tin'd Wire on Spools, 40%
Malin's Brass and Cop. Wire on Spools 30%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 2, 30%
Steel Music Wire, Nos. 12 to 30..55¢ ₱ Picture Wire.....New list, 50%
Barb Wire Safety Guards, ₱ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—
Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting.....75@75&5%

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....30%
Cast Steel.....40%

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40@10@50%
Baxter's Diagonal.....40@10@50%
Coes' Genuine.....55&3%
Coes' "Mechanics'".....55&10&3%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co..70&10%
Lamson & Sessions' Engineers'...60&10%
Lamson & Sessions' Standard.....70&10%
Goes' Pattern, Wrought..... } 75&10&5
Girard Agricultural..... } @ 80%
Lamson & Sessions' Agric'l.. }
Sterling Wrought..... }
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%

Wringers, Clothes—
List March 11, 1889, 2% cash.

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886, 80&20@80&25%

CURRENT METAL PRICES.

AUGUST 28, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
⅜ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.....	₩ lb 1.90 @ .. ¢
Refined Iron:	
⅜ to 2 in. round and square.. 1 to 4 in. x ⅜ to 1½ in.....	₩ lb 2.00 @ 2.10¢
4½ to 6 in. x ⅜ to 1 in ..... 1 to 6 in. x ¼ and 5-16	₩ lb 2.20 @ 2.30¢
Rods—⅝ and 11-16 round and sq.	₩ lb 2.10 @ 2.20¢
Bands—1 to 6 x 3-16 to No. 12	₩ lb 2.20 @ 2.30¢
"Burden Best" Iron, base price..	₩ lb 3.00 @ ... ¢
Burden's "H. B. & S." Iron, base price.....	₩ lb 2.80 @ ....¢
"Ulster".....	₩ lb 3.00 @ ....¢
Norway Rods	4.00 @ 5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....	2½¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots.....	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16.....	₩ lb 2.75	@ 2.80¢	3.25	@ .....¢
17 to 20.....	₩ lb 2.85	@ 3.00¢	3.25	@ 3.50 ¢
21 to 24.....	₩ lb 3.00	@ 3.10¢	3.50	@ .....¢
25 and 26....	₩ lb 3.20	@ ...	3.50	@ .....¢
27.....	₩ lb 3.35	@ 3.37½¢	3.75	@ .....¢
28.....	₩ lb 3.50	@ ...¢	4.00	@ .....¢
	B. B.		2d qual.	
Galv'd, 14 to 20,	₩ lb, 4.50	@	4.38	@ .....¢
Galv'd, 21 to 24,	₩ lb, 4.87½	@ ...	4.75	@ .....¢
Galv'd, 25 to 26,	₩ lb, 5.25	@	5.12	@ .....¢
Galv'd, 27.....	₩ lb, 5.62½	@	5.48	@ .....¢
Galv'd 28.....	₩ lb, 6.00	@	5.85	@ ....¢
Patent Planished.....	₩ lb A 10¢		B, 9¢	
Russia.....	₩ lb 9½¢	@ 10¢		
American Cold Rolled B. B.....	₩ lb 5¢	@ 7¢		
Craig Polished Sheet Steel.....	₩ lb, 8¢			

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast.....	₩ lb 16 ¢
Best Double Shear.....	₩ lb 15 ¢
Blister, 1st quality.....	₩ lb 12 ¢
German Steel, Best.....	₩ lb 10 ¢
2d qualty.....	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₩ lb 15 ¢
2d qualty.....	₩ lb 14 ¢
3d quality.....	₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	23 ¢
Straits, Pigs.....	22¼¢
English, Pigs.....	22¼¢
Straits in Bars.....	23¼¢

Tin Plates.

Charcoal Plates.—Bright.

		Per box.
Melyn Grade.....	IC, 10 x 14.. $5.75	@ $6 00
" "	IC, 12 x 12.. 6.00	@ 6.25
" "	IC, 14 x 20.. 5.75	@ 6.00
" "	IC, 20 x 28.. 12.00	@ 12.50
" "	IX, 10 x 14.. 7.25	@ 7.50
" "	IX, 12 x 12.. 7.50	@ 7.75
" "	IX, 14 x 20.. 7.25	@ 7.50
" "	IX, 20 x 28.. 15.00	@ 15.50
" "	DC, 12½ x 17.. 5.50	@ 5.75
" "	DX, 12½ x 17.. 7.00	@ 7.25
Call and Grade.....	IC, 10 x 14.. 5.75	@ 6.00
" "	IC, 12 x 12.. 6.00	@ 6.25
" "	IC, 14 x 20.. 5.75	@ 6.00
" "	IX, 10 x 14.. 7.25	@ 7.50
" "	IX, 12 x 12.. 7.50	@ 7.75
" "	IX 14 x 20. 7.25	@ 7.50
Allaway Grade.....	IC, 10 x 14.. 5.00	@ 5.12½
" "	IC, 12 x 12.. 5.12½	@ 5.25
" "	IC, 14 x 20.. 5.00	@ 5.12½
" "	IC, 20 x 28.. 11.00	@ ....
" "	IX, 10 x 14.. 6.00	@ ....
" "	IX, 12 x 12.. 6.25	@ ....
" "	IX, 14 x 20.. 6.00	@ ....
" "	IX, 20 x 28.. 12.00	@ ....
" "	DC, 12½ x 17.. 4.75	@ 5.00
" "	DX, 12½ x 17.. 5.75	@ 6.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20..	$4.75	@ $5.00
10 x 20..	7.25	@ 7.50
20 x 28..	9.75	@ 10.25
IX, 10 x 14, 14 x 20..	5.50	@ 5.75
BV Grade.—IC, 10 x 14, 14 x 20..	4.40	@ 4.60

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20..	$4.35	@ $4.62½
20 x 28.....	8.75	@ 9.25
IX, 14 x 20.....	5.40	@ 5.62½
20 x 28.....	11.00	@ 11.37½
Abecarne Grade.—IC, 14 x 20....	4.25	@ 4.50
20 x 28....	8.45	@ 9.00
IX, 14 x 20...	5.25	@ 5.50
20 x 28...	10.50	@ 10.80

Tin Boiler Plates.

IXX, 14 x 26	112 sheets.....	$12.50 @ $12.75
IXX, 14 x 28.....	112 sheets.....	12 75 @
IXX, 14 x 31	112 sheets	14.25 @

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake	@ 13½¢
"Anchor" Brand.....	@ 12½¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		20	20	20	21	22	23	26	28
30		72	20	20	20	21	24	25	29	...
36	96		20	20	20	22	24	28	30	....
36		96	20	20	21	23	25	29	31	....
48	96		20	20	22	24	26	30	....	....
48		96	20	20	23	25	27	31	....	....
60	96		20	20	25	27	32	....	....	....
60		96	20	21	26	....	....	....	....	....
84	96		22	22	....	....	....	....	....	....
84		96	22	23	....	....	....	....	....	....
Over 84 in. wide			23	25	....	....	....	....	....	....

All Bath Tub Sheets.....	16 oz.	14 oz.	12 oz.	10 oz.
Per pound.....	$0.23	0.25	0.27	0 30

Bolt Copper, ⅝ inch diameter and over, per pound..... 20¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier.....	23¢
12 ounce and up to 14 ounce to square foot.....	24¢
10 ounce and up to 12 ounce.....	26¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢

Tinning sheets on one side, 30 x 60 each ..... 30¢

For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each..... 15¢

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ..... 12¢

For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each..... 12¢

Tinning sheets on one side, other sizes, per square foot..... 2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ lb
12 oz. and lighter.....33¢. By the case...32¢ ₩ lb

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1½
8-14	6-12	35	31	28	27	26	25	22
15	13	36	31	29	28	27	26	23
16	14	37	32	30	29	28	27	23
17	15	38	33	31	30	29	28	24
18	16	40	34	32	30	29	28	25
19	17	41	35	33	32	31	30	27
20	18-19	42	37	35	34	33	32	29
21	20	44	39	37	36	35	34	32
22	21	46	40	38	37	36	35	34
23	22	48	42	40	39	38	37	37
24	23	51	44	42	41	39	38	39
25	24	54	47	44	43	42	41	43

Copper, Bronze and Gilding Tube, 2¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	25 @ 30 %

Roll and Sheet Brass.

Discount from list..... 25 @ 30 %

High Brass Rods.

Over 1 inch diameter	27¢
¼ inch to 1 inch diameter, both inclusive	24¢
No. 8 and less than ¼ inch diameter	26¢
Smaller than No. 8	30¢
Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.	

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	5½¢ @ 6¢
"Bergenport"	8¢
"Bertha"	7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks.....	6½¢
Per lb	7¾¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	4½¢
Newark	4½¢
Bar.....	4½¢
Pipe, subject to trade discount.....	6 ¢
Tin-Lined Pipe, subject to trade discount.....	15¢
Block Tin Pipes, subject to trade discount.....	45¢
Sheet, subject to trade discount.....	6¾¢

Solder.

½ @ ½ (Guaranteed).....	14½¢
Extra Wiping	12½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson.....	₩ lb 19¢
Hallett's	" 17¢

Fittings.

Cast Iron Fittings, Black and Galvanized.	75&10 %
Cast Iron Fittings, Bushings and Plugs	80 %
Cast Iron Fittings, Flanges	75&10 %
Malleable Iron Bushings	80@80&5 %
Malleable Iron Unions	70@70&5 %
Malleable Iron American Unions	55 %
Malleable Iron Unions, Keystone	55 %
Wrought-Iron Nipples	75&10 %
Wrought-Iron Couplings	70 %
Wrought-Iron Long Screws	70@70&5 %
Casing Fittings	60 %
Malleable Iron Fittings	40@40&5 %

Valves, Cocks, &c.

Iron Body Valves	70 %
Throttle Valves, Iron Body	70 %
All-Iron Valves	65 %
Compression Gauge Cocks	60 %
Mississippi Gauge Cocks	60 %
Register Gauge Cocks	65@65&10 %
Air Cocks and Radiator Air Cocks	65@65&10 %
Steam Gauge Cocks	60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle	65@65&10 %
Globe Oil Cups	55 %
Common Lubricators	65@65&10 %
Lubricators with Air Cocks	65@65&10 %
Iron Body Lubricators	60 %
Steam Whistles	65 %
Whistle Valves	65 %
Water Gauges	65 %
Brass Expansion Joints	55 %
Pump Valves	55 %
Soldering Unions	65 %
Soldering Nipples	70 %
Brass Unions (Union Joints)	65 %
Radiator Nipples	60 %
Fusible Plugs	60 %
Oil Pumps	55 %
Self-Acting Air Valves	65 %
Vacuum Valves	55 %
Steam Swing Joints	55 %
Iron Strainers	55&10 %
Jenkins' Iron Body Valves, except Gate Valves	60&10 %
Jenkins' All-Iron Valves, except Gate Valves	60 %
Jenkins' Iron Body Gate Valves	55 %
Jenkins' All-Iron Gate Valves	55 %
Iron Cocks, all Iron	65 %
Iron Cocks, with Brass Plugs	65 %
Brass Globe, Angle and Cross Valves	65 %
Brass Globe Valves, Finished	45 %
Brass Globe and Angle Valves, hose outlet	65 %
Brass Garden Hose Valves	65 %
Brass Caps for Hose Valves	60 %
Brass Horizontal, Vertical and Angle Check Valves	65 %
Brass Safety Valves	65 %
Brass Safety Valves, low pressure	65 %
Brass Safety Valves, low pressure, with balance weight	65 %
Brass Butterfly Valves	55 %
Brass Throttle Valves	55 %
Brass Radiator Valves	65 %
Brass Radiator Valves, Jenkins'	65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves	65 %
Brass Jenkins' Gate Valves	55 %
Brass Steam Cocks	60 %
Brass Gas, Meter and Union Meter Cocks	60 %
Brass Fittings, Rough	60 %
Brass Fittings, Finished	25 %
Brass Bushings	60

Plumbers' Brass Work.

Ground Key Work, Rough	60 %
Ground Key Work, Finished	55 %
Compression Work	60@60&5 %
Compression Work, Grundy, Heavy Pattern	55 %
Chain Stays	60 %
Basin Plugs	60 %
Sink or Bath and Wash Tray Plugs	60 %
Basin Clamps	55 %

FRENCH GLASS.

Per Box 50 feet.

	Sizes	Single. 1st.	2d.	3d.	4th.
		E F H	I E H	H H	H B
25	6 x 8 to 10 x 15	$10.50	$9.00	$8.50	$8.00
40	11 x 14 to 16 x 24	11.50	10.75	10.25	9.75
50	18 x 22 to 20 x 30	15.50	14.00	13.00	12.50
54	15 x 36 to 24 x 30	16.50	15.00	13.50	.
60	26 x 28 to 24 x 36	17.75	16.25	14.75	.....
70	26 x 36 to 26 x 44	19.00	17.50	15.25	.....
80	26 x 46 to 30 x 50	21.00	19.50	17.00	.....
84	30 x 52 to 30 x 54	22.00	20.25	18.00	.....
90	30 x 56 to 34 x 56	23.00	21.25	19.00	.....
94	34 x 58 to 34 x 60	24.00	22.75	21.00	.....
100	36 x 60 to 40 x 60	26.50	24.50	23.00	.....